DOCUMENT RESUME

ED 134 114 HE 008 596

AUTHOR	Purves, Ralph A.; Glenny, Lyman A.
TITLE	State Budgeting for Higher Education: Information Systems and Technical Analyses.
INSTITUTION	California Univ., Berkeley. Center for Research and Development in Higher Education.
SPONS AGENCY	Department of Health, Education, and Welfare, Washington, D.C.; Ford Foundation, New York, N.Y.
PUB DATE	76
GRANT	730-0552; NE-G-00-3-0210
NOTE	246p.
AVAILABLE FROM	Center for Research and Development in Higher Education, University of California, Berkeley, California
EDRS PRICE	MF-$0.83 HC-$12.71 Plus Postage.
DESCRIPTORS	*Budgeting; *Data Analysis; *Educational Finance; Educational Planning; Higher Education; *Information Systems; Program Planning; *State Agencies; *Statewide Planning
IDENTIFIERS	California; Colorado; Connecticut; Florida; Hawaii; Illinois; Kansas; Michigan; Mississippi; Nebraska; New York; Pennsylvania; Tennessee; Texas; Virginia; Washington; Wisconsin

ABSTRACT

The extent to which state agencies are implementing information systems and analytical methods for budget review are examined. Focus is on 17 states: California, Colorado, Connecticut, Florida, Hawaii, Illinois, Kansas, Michigan, Mississippi, Nebraska, New York, Pennsylvania, Tennessee, Texas, Virginia, Washington, and Wisconsin. Trends in budget information to state agencies and the bases for current concerns are reviewed. Higher education budget information categories are defined and a typology of information uses is presented. An overview is given of the trends in information and analysis activities typifying each of the state budget agencies, and the principal styles of budget review used in the states are also described. The informational content of state budget documents is delineated, followed by a discussion of the technical and political consequences of using information and analysis systems. The report concludes with a discussion of several major considerations to be weighed in setting up state-level information and analysis systems. (LBH)

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State Budgeting for Higher Education: Information Systems and Technical Analyses

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CENTER FOR RESEARCH AND DEVELOPMENT IN HIGHER EDUCATION
UNIVERSITY OF CALIFORNIA BERKELEY

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CENTER FOR RESEARCH AND DEVELOPMENT IN HIGHER EDUCATION
UNIVERSITY OF CALIFORNIA, BERKELEY

The Center for Research and Development in Higher Education is engaged in research designed to assist individuals and organizations responsible for American higher education to improve the quality, efficiency, and availability of education beyond the high school. In the pursuit of these objectives, the Center conducts studies which: 1) use the theories and methodologies of the behavioral sciences; 2) seek to discover and to disseminate new perspectives on educational issues and new solutions to educational problems; 3) seek to add substantially to the descriptive and analytical literature on colleges and universities; 4) contribute to the systematic knowledge of several of the behavioral sciences, notably psychology, sociology, economics, and political science; and 5) provide models of research and development activities for colleges and universities planning and pursuing their own programs in institutional research.

The research reported herein was supported by Grant No. NE-G-00-3-0210 from the U. S. Department of Health, Education, and Welfare, and Grant No. 730-0858 from the Ford Foundation. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgement in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent the official position or policy of the National Institute of Education or the Ford Foundation.

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CENTER FOR RESEARCH AND DEVELOPMENT IN HIGHER EDUCATION
UNIVERSITY OF CALIFORNIA, BERKELEY, 1976

Under the general title *State Budgeting for Higher Education* the Center is issuing nine publications, each with its own subtitle and authors. The volumes report three separate but interrelated projects carried on from July 1973 to August 1976, funded as follows: one on state fiscal stringency by the Fund for the Improvement of Postsecondary Education (FIPSE), another on state general revenue trends by the Lilly Endowment and the American Council on Education, and the third on selected aspects of state budgetary theory and practice by a joint grant from the National Institute for Education and the Ford Foundation. The principal investigator for all the projects was Lyman A. Glenny; the principal author or authors of each volume carried the major responsibility for it. To varying degrees, all members of the research team contributed to most of the volumes, and their contributions are mentioned in the acknowledgments. This report is the fifth to be issued in the series.

LIBRARY OF CONGRESS CATALOGING IN PUBLICATION DATA

Purves, Ralph A 1937-
Information systems and technical analyses.

(State budgeting for higher education)
Bibliography: p.
Includes index.
1. Education--United States--Finance.
2. System analysis. I. Glenny, Lyman A., joint author. II. Title. III. Series.
LB2825.P87 379'.1214'0973 76-51452

Acknowledgments

We are especially grateful for the financial support provided jointly by the National Institute of Education and The Ford Foundation. This cooperative venture of public and private funding agencies has provided a very hospitable environment for research.

An exceptionally high degree of cooperation and assistance was provided by state and institutional officials, often at considerable time and expense and, in many instances, during particularly busy periods. Needless to say, the study was entirely dependent on such help and we are especially grateful for their generous contributions. Answering questionnaires, providing documents, arranging interviews, and responding to letters and telephone inquiries are not the most rewarding activities for some of the busiest officials in state government. Yet all were most helpful.

The representatives of the national organizations who comprised our National Advisory Panel and the individuals who comprised the Technical Advisory Panel made significant contributions to this report through their critical comments and useful suggestions in response to project plans and report drafts. Their assistance broadened our perspectives and provided many useful insights. We are most appreciative. The members of both panels are listed below.

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In addition, we gratefully acknowledge the helpful criticism and comment of Frank Bowen, Anthony Morgan, Mel Orwig, and Frank Schmidtlein, who reviewed drafts of this report in whole or in part. These individuals may not necessarily agree with the final form their comments have taken, but they have immeasurably assisted us in avoiding errors of fact and interpretation. We especially thank Janet Ruyle for guiding the report through production, Harriet Renaud for editing the final draft, and Mildred Bowman and Margaret Elliott for preparing several versions of the manuscript, including the final one.

Preface

From July 1973 to August 1976 three studies of state budgeting and financing of higher education were conducted by the Center for Research and Development in Higher Education at the University of California, Berkeley.

The present study began in July 1973 when the Center undertook a three-year, 50-state study of the processes used by state agencies to formulate the budgets of colleges and universities. Seventeen states were studied intensively.*

Financial support was furnished jointly by the National Institute of Education (60%) and The Ford Foundation (40%). The study was endorsed by the following organizations:

American Association of Community and Junior Colleges
American Association of State Colleges and Universities

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* The 17 states were: California, Colorado, Connecticut, Florida, Hawaii, Illinois, Kansas, Michigan, Mississippi, Nebraska, New York, Pennsylvania, Tennessee, Texas, Virginia, Washington, and Wisconsin.

American Council on Education
Education Commission of the States
National Association of State Budget Officers
National Association of State Universities and Land-Grant Colleges
National Center for Higher Education Management Systems
State Higher Education Executive Officers

Its twofold purpose is to advance budgetary theory and to give state and institutional budget professionals a broader understanding of: 1) the interrelationships, roles, functions, and objectives of the several state agencies in the budgetary process; 2) the congruence or incongruence of such objectives among the several agencies; and 3) the practices and procedures that build confidence in the fairness of the budgetary process.

Reports based on the study describe and analyze the organizational structures and staffing of state-level agencies and the progress of institutional budget requests through these agencies from the time that prebudget submission instructions are first issued by a state agency until appropriations are enacted. The primary emphasis is on the budget review and analysis process and the procedures used by the state agencies; the study concentrates on the administrative interfaces among the several state agencies that review and analyze budgets and between these agencies and the institutions, or systems of institutions, of higher education.

Intensive interviews, document review, and questionnaires in the 17 states selected formed the basis for a narrative and tabular description and comparison issued in 1975. Less detailed data were collected from 50 states by questionnaire only; these are examined and presented in a second descriptive report.

The other volumes resulting from the three-year study are analytic in nature. This volume focuses on the development and use of information systems and analytic techniques. Others concentrate on the creation and use of budgetary formulas, the cooperation, redundancy, and

duplication of effort among the several state agencies that review budgets, and the dilemmas involved in the design of budget processes, along with a step-by-step analysis of budget progress through the labyrinth of state agencies and processes.

The second study, sponsored by the Fund for the Improvement of Postsecondary Education (FIPSE), examines how state colleges and universities respond when states make substantial reductions in their appropriations. This one-year study encompasses experience with fiscal stringency in about a dozen states, primarily in the five states presented in the case studies. The latter have been brought up-to-date as of late spring 1976.

The third study, sponsored by the Lilly Endowment and the American Council on Education, analyzes the trends in state general revenue appropriations for higher education from 1968 to 1975. Refining earlier work at the Center, the study compares trends among the states for the several types of institutions in both appropriated and constant dollars, comparing dollar increases with enrollment trends in each case and also comparing dollars appropriated for higher education with those for elementary and secondary education.

Each volume resulting from the three studies draws on significant findings of the other studies yet stands alone as a complete book. However, awareness of the full panoply of social, political, and economic variables that we found in state budgeting for higher education can be gained by review of all the volumes. We earnestly hope the readers learn as much from our research as we did in conducting it. A complete list of the volumes is found on the back cover of this book.

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1.

Introduction

In all, public colleges and universities in the United States currently receive approximately 40 percent of their operating income from state tax appropriations. This figure rises to 60 percent when income from noneducational activities and services such as auxiliary enterprises is subtracted (Carnegie Commission, 1973). With the advent of comprehensive executive budgets in most states, virtually all institutions now request these funds by means of a formal request procedure routed through the executive budget office. Requests from higher education institutions are considered along with requests from other state services and are ultimately the basis for a legislative appropriation, signed by the governor. There is considerable variation among states, but on the average about one-seventh of all expenditures from state general funds is appropriated for the operating expenditures of public higher education (Glenny & Kidder, 1973).

The entire scope of the state higher education budget process from request to appropriation is considered in another study in this series (Schmidtlein & Glenny, in preparation), which will report on specific details and variations in the procedures in use in 17 states. Based on the same 17-state data, the present report is focused primarily on the informational and analytical aspects of budget requests to the state and the technical procedures used by state budget agencies to review these submissions. Particular attention is given to the application of methods which objectify and rationalize the budget process, such as program budget submissions, new information reporting

structures and systems, and various microeconomic analytical techniques that have been developed for budget preparation and review.

A considerable volume of literature prescribing the implementation of budgetary reform has followed the experience with Programming-Planning-Budgeting (PPB) in the federal government. As yet, relatively little empirically based research has been reported on the implementation of reforms to alter and improve the technical aspects of the state higher education budgeting process. For many years budgetary formulas subsumed a great deal of the information and analysis used in higher education. Miller (1964) reported on the use of "formulas and cost analyses" in state budgeting for higher education, and Gross (1973) recently surveyed the states to determine the extent to which formulas are used. Identification of the techniques of budget development and state-level review with formulas has emphasized the inflexibility of formulas whose application has often tended both to lock in funding inequities as well as preserve levels of support. Under current conditions, budget requests generated by formulas cannot always be funded by available revenues; furthermore, institutions have difficulty adjusting to lower enrollments when funding is mechanically tied to enrollments by formulas. Thus, the greater flexibility and discretion needed in the use of resources when funds are limited require a more sophisticated technical review of operations and issues. Consequently, the term formula is used in this report in a fairly restricted sense, although the subject matter does coincide generally with what Miller (1964) has treated in his discussion of the technical features of formulas. The report in this series on formulas (Meisinger, 1976) treats the organizational and political uses of budgetary formulas, but does not describe the technical use of quantitative information and its use in support of budgets, aspects with which we shall be concerned.

FOCUS OF THE STUDY

A major portion of this report is descriptive, in order to provide an up-to-date review of the extent to which state agencies are implementing information systems and analytical methods for budget review. This is important for at least two reasons: A descriptive overview can lead to more realistic expectations of what state agencies can achieve in implementation, and it can identify more clearly the options in budget information gathering and review that state agencies have open to them. In addition to describing what each of the 17 states does, we have developed analytical categories of information and its use to show both commonalities and differences from state to state.

We have also attempted to evaluate budgetary information and review systems by considering some of the implications and consequences of their use. That analysis can improve public decisionmaking is taken as an article of faith, but current use of analysis in the process must be understood before changes in its use can have a beneficial effect. One university president interviewed expressed the belief that the outcome of the budget process in his state had relatively little to do with technical budget review procedures. The procedures, he felt, were only a way of rationalizing a decision made on the basis of political realities. At the same time, it was clear to us that the capacity of interest-group politics for adequately resolving all budgetary allocation decisions is overtaxed by the number and complexity of the decisions that must be made.

The methodology for this study has not involved the testing of hypotheses nor the application of rigorous analytical techniques. Our objective has been to determine actual state practice rather than to develop budgetary theory. Budget documents and materials from each of the 17 states were reviewed to see the kind of information that was submitted and the manner in which it was displayed. In addition, site visits were made to each of the states, and to determine the methods of review, all state-level officials in executive, legis-

lative, or higher education agencies involved in the formal examination of higher education operating budgets were interviewed. Unless one can actually work in an agency for an extended period, "use" of a system or a technique is difficult to ascertain. On the other hand, by being able to talk with budget process participants at all levels of the state bureaucracy, the outsider may gain an awareness of features of the process that are obscured from the participants. The description in this report is intended to describe actual use, not planned or hypothetical use, although plans are important in suggesting future development. If anything, this report may err on the side of implying too great a level of implementation of standardized information collection and rational quantitative budget analysis, but the trend in this direction is clear. Current dissatisfaction with the way public agencies or institutions are serving public needs can rarely be attributed to the use of too much analysis in the decision process.

PLAN OF THE REPORT

The remainder of this chapter reviews trends in budget information to state agencies and the bases for current concerns. In Chapter 2, higher education budget information categories are defined and a typology of information uses is presented, and the sense in which management information systems are to be understood in this report is explained. Chapter 3 presents an overview of the trends in information and analysis activities typifying each of the state budget agencies. Chapter 4 begins the major description of technical budget review by describing the principal styles of budget review used in the states. Chapter 5 delineates the informational content of state budget documents, and is followed in Chapter 6 by a discussion of the technical and political consequences of using information and analysis systems. The report concludes with a discussion of several major considerations to be weighed in setting up state-level information and analysis systems.

TRENDS IN INFORMATION SUBMISSION

The submission of information to state budget review agencies in support of operating budgets prior to legislative review is certainly not a new practice, although it is one that has increased dramatically over the last few years. Discussions of state budgeting for higher education, even for the postwar period, are sparse, but sources such as the Council of State Governments (1952), Glenny (1959), Miller (1964), and Moos and Rourke (1959) have suggested that recent requirements for additional budget information were initiated long ago, although perhaps only in more isolated instances. For example, the Council of State Governments reported for 1948 that out of 162 governing boards reporting, 140 boards (governing 327 institutions in 43 states) submitted their budget requests to a central budget authority for revision before these requests were consolidated and submitted to the legislature. Only three boards submitted requests directly to the legislature.

What actually may have changed, more than the substance of what is being reported and the way it is reviewed, is the changed attitude of the general public and its elected officials, which now see higher education as an integral part of the state governmental structure. Public institutions have always faced the problem of how to present budgetary demands to state agencies. Current criteria for an effective submission or a justified request may relate more to changes in the environmental context in which higher education operates than to its intrinsic operations.

Although higher education budget submissions to state agencies have a long history, changes in various features of these submissions point up some significant trends:

- *Quantity.* There has been an increase in the amount of data required of budget submissions as state agencies have sought information on institutional operations in greater detail.

- *Comparability.* Attempts at making data more comparable through the application of uniform definitions have been intensified.

- *New categories.* Information has been requested in new types of aggregations and categories--quite frequently in multiple data structures.

- *New items.* Information has been requested on new items such as educational outputs, target groups, and educational unit costs.

- *Systems.* Attempts to build systems for collecting and reporting information, particularly through the application of computers, have become common.

THE BASES FOR INFORMATION CONCERNS

Seasoned budget practitioners tend to be unimpressed by the promises made or the expectations held out for many suggestions for budgetary reform, including changes in information submission. Thus, one sees few states in which these reforms are championed with the same enthusiasm that they are in some management consultant circles or graduate professional schools. Yet, state and institutional officials continue to seek new methods for making budgetary choices (with new information requirements) in all public agencies, with perhaps greatest intensity in higher education. Among the many reasons for this concern are seven general factors.

1. There is the general concern over establishing management control in a public agency to foster efficiency and constraint in the use of public funds. Niskanen (1972) answered the question "Why new methods?" with the general observation that "Governments do not serve us well." He argued more specifically that the budget process is incoherent, that decisions on the parts are inconsistent with decisions on the total. "Our political processes suggest an increasing demand for individual programs, but opinion polls indicate a substantial and increasing popular concern about total federal spending" (p. 156).

Further, as important as any temporal factor, according to Niskanen, is the unique factor inherent in governmental budgeting which is absent in budgeting for corporate firms: Governments do not face the conditions that make the economic calculus and the balance sheet relevant to a business firm. Governments are nonprofit monopolies "whose objectives do not provide consistently strong incentives to use the economic calculus" (p. 156), and as a consequence, various budgetary procedures are commonly seen as a substitute for incentives that are formed in a competitive market.

2. The notion that a minimal level of statewide coordination is necessary has taken root in virtually all states, although the individual states differ with respect to the kinds of higher education decisions they consider to be properly within the domain of state responsibility. In budgetary matters, public institutions have clearly had to involve state government officials in the process through which they receive appropriations from state tax funds. A well-established method for achieving coordination, which usually stops short of according actual decisionmaking authority, is creation of a state-level agency with the responsibility for knowing what the state's colleges and universities are doing so that the activities of one can be related to the activities of the others. An important resource in fulfilling this function is a formal information gathering and reporting system.

3. The belief exists in some quarters that administration and management in higher education institutions are somehow not on a par with, say, the management of corporate enterprises of similar size. There is therefore an interest in strengthening formal procedures, especially in the areas of budgeting and fiscal control, which are the core of management responsibility in the private sector. A state legislator reflected this view when he noted that many of his legislative colleagues who had managed private businesses were astonished by college administrators' inability to provide information that the legislators themselves had considered essential in their own businesses. This fueled the move in his

state, as it had in others, to require that certain institutional information be provided to state budgetary agencies as a way of ensuring that the institutions themselves had the information.

Even when state officials are not greatly concerned about the capabilities of institutional administrators and their systems of management, they may still express a wish for more detailed information on institutions because they have substantially less control over colleges and universities than they do over other state service agencies. One state director of administration indicated, "I would feel more comfortable if we knew more about the university in detail, even though decisions wouldn't be based on this detail."

4. In the higher education budget process, at least three state-level agencies may be striving to carve out a legitimate role. Introduction of reforms into the budget process is often either the initial step in shifting influence or a direct response to it. Because the state higher education agency is a new participant in the budget process in some states, it has a relationship to establish with both the legislature and the governor's budget office. At the same time, many legislatures are seeking an expanded role in state policy along the lines suggested by the Citizens Conference on State Legislatures (1971). Policy involvement requires access to information, and therefore the attempt to take on new or expanded functions by these state agencies quite often begins with a proposal for more systematized information distribution. Reforms or innovations of the budget process are rarely neutral with respect to power and influence relationships that exist between state agencies, and reforms are rarely accepted wholeheartedly by all agencies involved.

5. In some, but by no means all states, recently hired budget staff or their directors have been instilled, through academic training or experience in other organizations, with the zeal for activism and reform that characterizes the core of any established profession. Professions are built around the practice and applica-

tion of a codified body of knowledge, and in budgeting, this body of knowledge or discipline stems largely from economics--accounting, public finance, or operations research, and political science. The major tenet of this professional core has been that scientific thinking should be applied to the solution of social problems, and it therefore tends to emphasize systematic, rational, and quantitative approaches to budgeting. An interest in program budgeting is likely to come from this quarter.

Berdahl (1971), in his treatment of state government and higher education relations, has linked information system development in the states with attempts to introduce program budgeting for higher education. While the implementation of program budgeting depends on the availability of systematized information in special categories, so does virtually every other kind of budget reform. We found strong and continued interest in developing statewide information systems even though attempts to implement formal program budgeting systems have waned considerably.

6. Although much of the discussion surrounding efforts to improve the management of higher education is expressed in terms of improving efficiency, there are a number of indications that the real concern is about the level and kind of higher education being provided. Public preferences for higher education appear to be changing, as has been indicated in the recent decrease in age-specific participation rates. The kinds of education being provided are also changing in response to changing labor market conditions. But because the public does not pay for public higher education services in individual units, the pressure of this changing demand is felt on the budgetary process. Demand for information is a tactic, or ploy, in the bargaining that determines the "price" state government will pay for an entire bundle of higher education services over the course of a year or a biennium. Having to provide information on some relatively simple indicators of funding level or performance can serve to weaken the budgetary arguments of those institutions which are funded richly according to these indicators, without making it necessary to increase funding for institutions which are funded poorly. Those

who are getting less have the weight of history going against them, for their existence is evidence that they managed to survive the previous year.

Even where the demand for higher education does not appear to be falling in a particular state, the budget constraints of recent years may make it essential that state budgets be pared, and higher education is both a major expenditure item and vulnerable on political grounds. It is also a highly discretionary item, being funded by almost all states from the general fund rather than from various earmarked funds. Except for the community colleges in some states, public higher education is rarely funded through statutory formulas, as elementary and secondary education or public assistance often are.

Even without any strong connection with the demand for higher education, new budget techniques are often tried selectively in higher education. (Apparently some states have singled out higher education as an exception from program budgeting, but none of the states examined in detail for this study had done so.) Howard (1973) has suggested that new budget techniques be attempted first in an agency under one head which has limited duplication and overlap with other agencies. Higher education may present special problems when program budgeting is attempted because of the complexity of its outputs, but for organizational reasons, higher education may be an advantageous agency in which to begin.

7. Recently, the concept of accountability has been invoked repeatedly to justify the increasing penetration of state agencies into the management of higher education institutions. Elected officials are, of course, ultimately accountable to the electorate and may be voted out of office. But other state executives--department directors, for example--are not elected and therefore must be accountable to the electorate and its representatives in some other sense.

Accountability has been used in a number of senses as a characteristic of the web of relationships whose sum total is the governance process of higher education

institutions. Accountability appears to have at least two interpretations, both of which have far-reaching implications for centralized information reporting and budgetary review procedures. The first is that accountability is an extension of the fiduciary responsibility that administrators have to assure that budgeted funds are not spent illegally or improperly. This means that higher education administrators are accountable to state officials for the specific performance of their institutions. Because an institution supported by state resources is presumed to have a schedule of services to perform, institutional administrators are accountable in the sense that a postaudit would be possible, at least in theory, which would check performance against specific objectives. This notion of accountability has obvious implications for budget submission and the provision of information because these educational outputs (services) must be identified, quantified, and linked to budgetary requirements.

The second interpretation focuses attention on decisions and choices made by state officials rather than on performance. Accountability in this sense literally calls on administrators to account for their decisions or, in particular, their budgetary choices, by providing an appropriate supporting rationale that demonstrates they made considered choices on the basis of adequate and appropriate information and analysis. This is analogous to the management audit function in administration which tries to ensure that accounting systems are adequate to prevent fraud and mismanagement. To provide decision accountability, methods of decision are scrutinized for their adequacy in supporting "good" decisions. Budgetary requests, then, must be documented with information to show that decisions have not been reached arbitrarily.

From these seven general factors which seem to lie behind efforts to improve the substance of budget requests to state agencies, one should not infer that all the initiative lies at the state level and that institutions are merely passive respondents to the information demands of state agencies. More than ten years ago Miller (1964) commented that two problems that act as catalysts for the

development of budgetary formulas and cost analyses are the problem of securing an equitable distribution of funds among institutions, and the problem of providing sufficiently objective justifications to satisfy state budget offices and legislatures. He noted some expressions of surprise at the slowness with which objective devices have been developed and adopted for higher education budgeting, and suggested that this was indicative of substantial legislative trust and good will toward colleges and universities. At present, it appears that the reserve of good will to which he referred is becoming exhausted (more so in some states than in others, of course), and that the incentive for providing sufficiently objective justifications to satisfy state-level agencies is operative once again. The institutions, like the state agencies, have a clear interest in developing budget information formats and substance which will win the approval of their state reviewers.

2.

Budgetary and Financial Information: Taxonomies, Uses, and Systems

Although the states differ markedly in the details of their budgetary procedures, the broader issues involved in the submission of higher education data to support requests for state appropriations are remarkably similar. These issues commonly pertain to:

- The kind of data to be provided
- The format or organizing structure within which the data are collected or displayed
- The uses of the data in the budget process to satisfy various budgetary functions
- The development of systematic procedures for gathering and reporting data

Each of these topics is the subject of a lengthier discussion in subsequent chapters. However, in order to define the substance of these issues and the terms used to describe them in this report, this chapter is devoted to a brief discussion of the concepts and theory which will be applied in the subsequent description and analysis.

KINDS OF DATA AND SYSTEMS FOR ORGANIZING THEM

Data are simply recorded facts or observations which become information when they are related to a decision in a particular context. Budgetary data are principally

expenditures of some sort, but they may also include measures of institutional activity related to students, facilities, instruction, research, administration, and educational outcomes expressed in various dimensions. In addition to the distinguishing subject matter to which data pertain, there are three important characteristics that distinguish the data used in the budget process from data used in other organizational and management activities: the extent to which data are combined or aggregated; the origin of the data as either observation, estimation, or projection; and the perspective used in combining the data.

Data which describe a single event or transaction, rather than a sum of many similar events over an extended period of time, are not very useful during the early stages of the budgeting process because of the emphasis on the planning function during this stage. Attention is directed to aggregates of expenditures and activity levels because it is usually unnecessary, if not impossible, to specify transactional details in advance. Because the focus is on a future period, the data in budget requests are largely estimates and projections rather than what might be called "hard" data, that is, actual observations from the historical past.

Systems for organizing data primarily arise from two perspectives: an operational perspective which relates data to the day-to-day operations and activities of institutions and a programmatic perspective which relates data to the objectives and goals of an institution. In practice, operational data systems are structured in terms of the items or objects for which budgetary expenditures are made, or the functional and support activities which institutions are engaged in. Programmatic data structures, in theory, differentiate the purposes of governmental activity into distinguishable programs which may or may not parallel organizational lines, depending on the structure of bureaus, agencies, and institutions. In practice, however, a programmatic structure is difficult to distinguish from functional or activity classifications, because an agency's goals and missions are most easily stated in terms of its activities, which also

serve to distinguish the agency along organizational lines. Data structures for each of these expenditure perspectives could be unique to a state's procedures, but in the interest of achieving comparability they are usually applied according to standardized conventions, with various modifications.

Object of expenditure categories refer, of course, to the specific items which a budget will purchase. Following is the object of expenditure classification used in federal budgeting (U.S. Bureau of the Budget, 1960).

PERSONAL SERVICES AND BENEFITS
- Personnel compensation
- Personnel benefits
- Benefits for former personnel

CONTRACTUAL SERVICES AND SUPPLIES
- Travel and transportation of persons
- Transportation of things
- Rent, communications, and utilities
- Printing and reproduction
- Other services
- Supplies and materials

ACQUISITION OF CAPITAL ASSETS
- Equipment
- Lands and structures
- Investments and loans

GRANTS AND FIXED CHARGES
- Grants, subsidies, and contributions
- Insurance claims and indemnities
- Interest and dividends
- Refunds

Most states employing such a classification use a more condensed version which only shows Personal Services, Contractual Services, Supplies and Expenses, and Capital Expenditures. The principal merit of this kind of classification, at least in its more detailed version, is that it merges directly with the budget execution phase of central budget office activity. Because budgets are spent on

objects in individual transactions, budgetary planning in this same mode can be linked directly with the allotment and control of funds during budget execution. The set of categories in use is clearly applicable to all kinds of agencies.

The standard classification of institutional functions and activities is that devised by the National Association of College and University Business Officers (NACUBO), the basis of the accounting structure that virtually all institutions use for their financial reporting. The details for the current funds expenditure accounts are shown in Appendix A-1. Its major expenditure categories, which are the aggregates used in functional budgeting are:

EDUCATIONAL AND GENERAL EXPENSE
- Instruction and Departmental Research
- Organized Activities Related to Education Departments
- Sponsored Research
- Other Separately Budgeted Research
- Other Sponsored Programs
- Extension and Public Service
- Libraries
- Student Services
- Operation and Maintenance of Physical Plant
- General Administration
- Staff Benefits
- General Institutional Expense

STUDENT AID

AUXILIARY ENTERPRISES

The source for this structure of accounts is the National Association of College and University Business Officers (1968), 2nd edition. It should be noted that the 3rd edition of this volume (1974) is now available and provides a new set of functional classifications which are somewhat revised from those shown above. At the time of our field investigations, this new set of accounts was

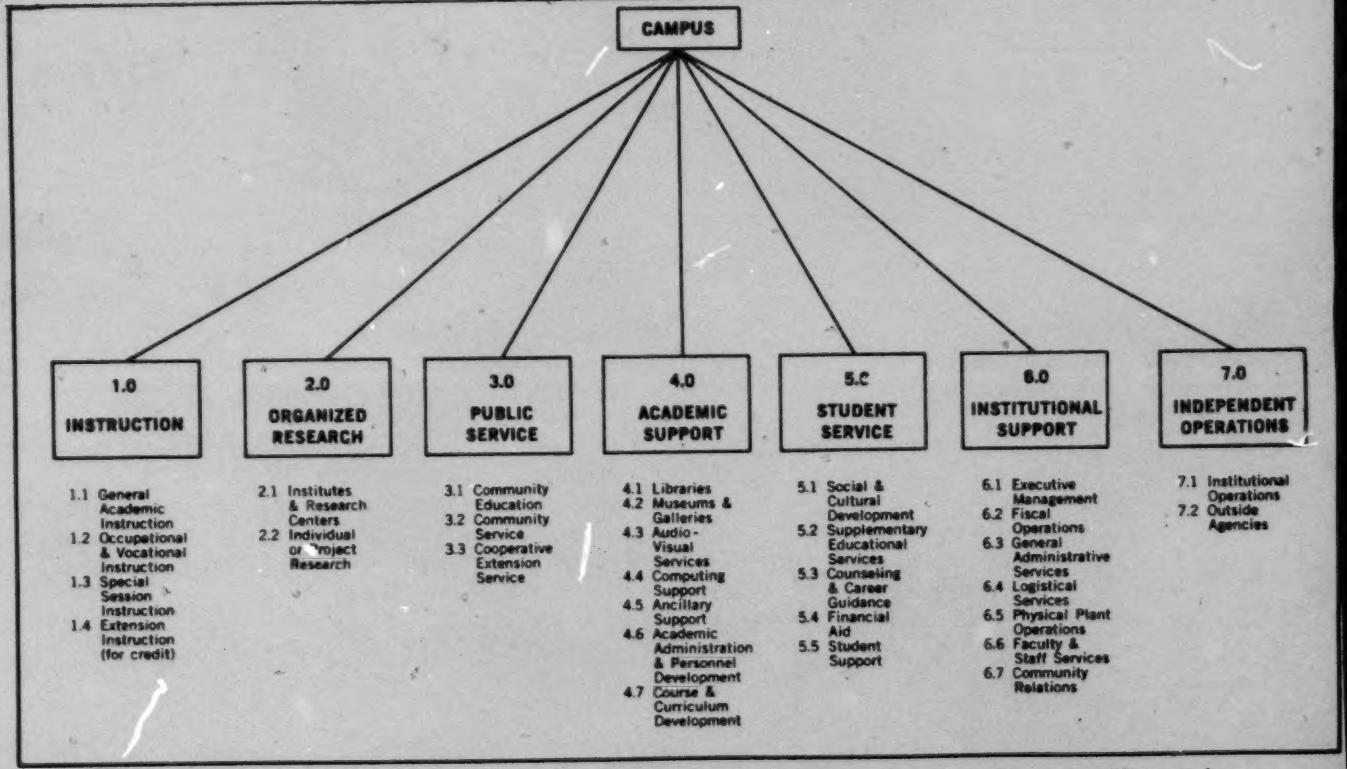
not yet in use at the state level, and therefore "functional" in this report should be associated with the accounts from the 1968 edition. Institutions will gradually shift to the new structure, and it may be assumed that state-level classifications will change as a result. Although some changes in assignment of activities to various functions have been made in the new structure, the major changes involve new aggregations of major functions and slightly altered names. These are changes which should be accomplished at the institutional level with very little delay. Appendix A-2 contains a description of the most recent NACUBO current funds expenditure accounts.

The standard programmatic structure is that developed by the National Center for Higher Education Management Systems (NCHEMS) in the *Program Classification Structure* (Gulko, 1972). Exhibit 1 displays the version that appeared in the 1st edition of the Program Classification Structure. This structure was intended as the basis for developing a formal program planning and budgeting system for higher education. However, inspection of the individual programs reveals that they are not very different from the functional categories of the NACUBO classification. As noted earlier, a longstanding technical difficulty in the application of program budgeting has been the specification of a program structure that can be linked unambiguously with an existing system of bureaus or institutions. In March 1974, a Joint Accounting Group, consisting of representatives of NACUBO, the American Institute of Certified Public Accountants, and NCHEMS designed a set of expenditure subcategories and "cross-over" conventions which makes it possible to relate expenditures reported according to the NACUBO chart of accounts developed in the 1974 edition of *College and University Business Administration* to Gulko's (1972) *Program Classification Structure*. A comparison of these two account structures can be found in Collier (1975).

For all intents and purposes, any conceptual distinction between the two systems is removed when data to be formatted according to the Program Classification Structure is derived from an operational rathern than a

Exhibit 1

ORGANIZATION OF THE PROGRAM CLASSIFICATION STRUCTURE



Reprinted from Gulko, W. W. Program Classification Structure (Technical Report 27). Boulder, Colo: National Center for Higher Education Management Systems at WICHE, 1972, p. 19.

programmatic set of accounts. The major practical consequence of using functions rather than programs is that use of the functional set of accounts results in a larger number of budget categories and slightly different aggregations of the major subcategories. For the budget year 1974-75, both sets of accounts were being used by various states. In 17 states we found no use of a programmatic account structure based on higher education goals and objectives. Although conceptually one can envision that such an account structure might be designed (see Dyer, 1970), in practice it is expedient, if not essential, to base "program" expenditures on operational data. In higher education, as with many social services, a programmatic structure for budgeting is difficult to establish because the recorded operations of the institution, its basic operational transactions (enrolling a student, hiring a faculty member), do not explicitly involve measuring attainment of its stated goals and objectives (student development, expanding knowledge). Nonetheless, in many instances, the use of programmatic classifications in budgeting is indicative of a subtle shift toward a more substantive review of agency activities and intentions.

Contained within the Program Classification Structure is another standard structure, that of the various disciplines issued in the National Center for Educational Statistics (NCES) *Taxomony of Instructional Programs* (Huff & Chandler, 1970). This structure, like the Program Classification Structure, does not usually coincide exactly with the organizational arrangement of instructional departments in a college or university. However, the extensive use of this structure in the data gathering activities of NCES makes it a logical choice as an instructional program structure for use in budgeting. It is known as the Higher Education General Information Survey (HEGIS) Taxonomy and is shown in Appendix B. The HEGIS taxonomy and codes are used widely in budgeting at the two-digit and four-digit levels.

The broad uses to which budgetary data may be put in planning, decisionmaking, or controlling are obviously not equally served by the various means of data organization. Consequently, budget submissions often include

data in more than one format. It may be particularly useful in some instances to mix display formats by further disaggregating data already classified by program or function into object of expenditure categories. It is also possible to preserve the underlying higher education organizational structure by displaying organizational unit data in terms of objects, functions, and programs, or by some mix of these, and then recombining them at the state level.

USES OF DATA IN THE BUDGETARY PROCESS

Use implies purposes and objectives, and therefore use of data in the budgetary process must be interpreted with reference to the functions or the purposes of budgeting. The budgetary process moves through a cycle of phases which may be described as "preparation and submission," "approval," "execution," and "audit" (Lee & Johnson, 1973). Each of these phases serves particular functions. In the context of state budgeting for higher education, the first two of these phases were described as "institutional budget preparation and submission," "agency review and analysis," and "legislative review and appropriation" (Glenny, Bowen, Meisinger, Morgan, Purves, & Schmidtlein, 1975, pp. 27-31). This study of information and analysis systems, like the broader study reported on in the other volumes in this series, is concerned primarily with agency review and analysis and legislative review and appropriation. Legislative approval of the budget and the use of the governor's veto are procedural features of the process which have interesting variations among the states, but do not directly involve the use of information and analysis and thus are outside the scope of this report.

Analysis and the use of quantitative justifications have their primary application during budget preparation, but information submission continues during execution of the budget and is also a primary concern in connection with the process of postaudit. We examined the process of institutional budget preparation and submission selectively because it precedes the process of state agency review, but execution and postaudit were not

generally considered. The portion of the budget process on which we concentrated attention--budget preparation and submission--is the one most suited for relating planned expenditures to the policy objectives of state officials and higher education administrators. In the everyday work of budget agencies, the entire range of budget cycle activities is often carried on simultaneously because processes overlap for past, current, and future budget cycles. As a consequence, there are many opportunities for interaction between budgetary functions and the use of data during different phases of the process. Thus, use of data during the agency review and analysis phase cannot be completely decoupled from the control function of budgeting, which is more directly associated with budget execution.

Current discussions of budgetary functions are heavily influenced by the functions derived by Schick (1966) from a functional classification of management planning and control systems described by Anthony (1965). From this perspective the budgetary process is simply a particular planning and control process. Anthony defined three categories of managerial process as: *strategic planning*--the process of deciding on objectives of the organization, changes in those objectives, the resources used to attain those objectives, and the policies that are to govern the acquisition, use, and disposition of those resources; *management control*--the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives; and *operational control*--the process of assuring that specific tasks are carried out effectively and efficiently. Management control is distinguished from operational control by requiring somewhat greater judgment and by being concerned with the direction of people rather than the accomplishment of specific tasks. Although Schick's (1966) own discussion tended to support treatment of these processes as separate processes, he emphasized that:

> Operationally, these processes often are indivisible, but for analytic purposes they are distinguished here. . . . Planning is

> linked most closely to budget preparation, but it would be a mistake to disregard the management and control elements in budget preparation or the possibilities for planning during other phases of the budget year. The management process is spread over the entire budget cycle; ideally it is the link between goals made and activities undertaken. . . . Control is predominant during the execution and audit stages, although the form of budget estimates and appropriations often is determined by control considerations. (p. 244)

Schick's treatment has also stimulated a conceptualization of the budgetary process as the analog of a zero-sum game in which increased emphasis on planning and management lead to decreased emphasis on control and vice versa. However, as the discussion of public budgeting has been elaborated by further studies of governmental budgeting, most observers have come to regard shifts in emphasis on the various phases of the budget process as responses to changing budgetary environments and policy contexts rather than phased shifts from control to management and planning. Thus, with the reservation noted above concerning the interaction of functions among phases, the preparation and review phase is predominantly one that emphasizes planning, although the degree of emphasis on planning varies among states and within a state itself as revenue conditions and policy concerns change.

Our impressions are that state managerial control systems function largely within higher education systems or institutions. Operational control, where it exists, is clearly at a lower level within the institution. However, state-level managerial and operational control systems do exist in the form of position control, restrictions on the transfer of funds between budget classifications, and other procedures designed to achieve compliance with central policy at the operating level. Although these systems are outside the budget preparation and review process, they are often important in setting the basis for subsequent controls.

Schick's classification neither explicitly treated the overtly political or organizational functions of the budgetary process nor recognized the distinctions between internal budgeting within an agency and budgeting involving the overhead control organizations which are participants in the state budgeting process for higher education (Simon, Smithburg, & Thompson, 1970). As overhead control agencies, state budget agencies are involved in management most frequently through monitoring the activities of line organizations. Often excluded from direct responsibility for higher education management decisions by subtle and not so subtle differences in authority stemming from constitutional status or tradition, budget agencies nevertheless influence management decisions through their ability to impose budget sanctions.

During state agency review, the explicit use of information appears to fall into four activities, described below.

1. *Checking.* Involves the detection of error in budget requests, and ranges from detecting and removing arithmetic errors to the more substantive checking involved in eliminating unintended consequences of proposed expenditures--such as a legal conflict, or a conflict with federal or local expenditure programs.

2. *Costing.* Not merely calculation, costing is the attempt to estimate the justifiable fiscal needs of a proposed program or organizational unit in light of historical accounting costs. Usually, the basis for this calculation is the preceding year's budgetary requirements, but inflation, changes in activity levels, the existence of joint products, or the fact that there has been no previous expenditure for a comparable item may necessitate the application of judgmental estimates and cost-allocation conventions.

3. *Evaluation.* Ultimately requires, as the word implies, setting a value on the program in question in relation to other expenditure programs. It usually begins with procedures for examining programs in comparison to other programs in terms of their costs, or with respect

to the technology of the program, as in a consideration of the use of inputs for the program. Evaluation may also include an examination of earlier program impact and performance. Formal evaluation procedures are frequently grounded in economic theory and cost-benefit analysis. Values are measured by market prices where these are available, or are estimated by means of a variety of techniques (see Chase, 1967). The cost concept employed is that cost is the value of resources when employed in their most valued alternative use. Clearly this may be very different than historical cost. For example, under the concept of historical cost, faculty costs would be estimated from what faculty salaries have been historically. In a cost-benefit analysis, however, faculty costs might be estimated from the faculty salaries of the highest paying comparable institutions, or the salaries of comparable professionals in industry or government.

Final valuation of programs tends to be implicit rather than explicit, and often comes as a result of bargaining--as in the determination of a price for a transaction in the market place. The price an individual is willing to pay for a service depends on his personal values, although if the provider is to stay in business, the price agreed on must cover the cost of providing the service. In state budgeting, it is a widely established principle that the price paid by the state for the provision of public higher education services be determined by the accounting cost of that service. This, however, tends to suppress what are really questions of societal values, especially when the provision of a new social service or the suspension of a continuing service is being considered. In the interest of consensus, binding budgetary procedures, such as formulas that combine costing and pricing in a single operation, are often used to blur the distinction between costing and pricing (evaluation).

4. *Bargaining.* The final adjustment of recommendations and appropriations at the margin in which common ground in the preferences of participants is sought, after which the result is adjusted to reflect the realities of

political influence and authority. In bargaining, information is used as a resource in trying to persuade, or to gain a competitive advantage over other budget process participants.

From a broader and more behavioral perspective, Burkhead (1956) described governmental budgetary functions as "expertise," "communications," and "responsibility" functions. The purpose of the *expertise function* is to assess economic, sociological, administrative, and technological considerations that can be informed by facts. It consists of measuring and comparing a broad range of characteristics of current governmental efforts, the consequences of such efforts, and their alternatives. The *communications function* involves gathering the views and preferences of interested and affected groups, and the *responsibility function* employs means and procedures for appraising the political acceptability of alternative proposals and establishing patterns of responsibility for making budgetary choices. In effect, the budget process must establish ground rules as to who will have access to budgetary decisions and who will take the responsibility. Burkhead argued that a legislative budget system is not truly a budget system at all because responsibility patterns are so often ill-defined. Budgetary functions, however, cannot be compartmentalized; all functions are merged in the final budgetary decisions.

Burkhead's conceptualization of the functions of governmental budgeting encompasses far more than the use of information and analysis systems. Indeed, because it recognizes the political and the legitimating functions of the budgetary process, it covers more than the processes of planning, management, and control. This report will shed more light on the technical use of information, that is, on the use of information which satisfies the "expertise" function in budgeting. These technical uses, however, must be considered within the context of the wider functions of the budget process because, as suggested in Chapter 1, new methods of budgetary choices are not being considered solely or even principally because of technical inadequacies in the present process. Deficiencies in responsibility and communications

functions are currently considered to be a problem in the area of accountability.

INFORMATION AND ANALYSIS SYSTEMS

Administrative procedures are increasingly referred to as management systems, for in many instances these practices not only involve comprehensive and centralized direction and management, but sometimes also automated data processing equipment and computer systems. This report deals with the information reporting and analytical procedures used in state agency reviews of higher education budgets and thus, by extension, with the information and analysis systems that state agencies are developing for meeting their specific budgetary responsibilities.

During the course of this study, we sensed that budget process participants had a fundamentally ambiguous attitude toward information and analysis systems. On the one hand, virtually every state agency and higher education institution spoke of the need for developing comparable sources of information across a broad spectrum of higher education and socioeconomic phenomena; on the other hand, very few agencies or institutions have developed these sources into a widely recognizable, acceptable management information system (MIS). A large part of this uncertainty over the use of management information systems in the state higher education budget process results from an inability of those who would implement these systems (as well as those who would save us from them) to precisely define what they mean by a higher education management information system at the state level. Some consider MISs to be another chapter in the management philosophy which sired PPB (Planning-Programming-Budgeting), MBO (Management by Objectives), and PERT (Program Evaluation and Review Technique). Many who use the term emphasize the use of automated data processing equipment and computers. Others use it to mean little more than an extension of what "good" managers, planners, and analysts "have always done" in trying to gather more reliable and more comparable data to aid managerial decisionmaking. From a somewhat narrower perspective, according to Weiss (1970), manage-

ment information systems may be patterned after four broad models which are, however, not mutually exclusive:

- A combination of functional internal and external information gathering networks which serve the information needs of the organization.

- A part of the management process which assists in fulfilling the decisionmaking function of management, primarily in the areas of planning and control.

- A managerial reporting system in which information is routinely reported on a preset schedule for central storage, from which it can be withdrawn by various users.

- An information processing system consisting of hardware, software, and human beings.

From the description of information and analysis procedures discussed in the following chapters, assessments can be made of how extensively MISs have been implemented. It is important, however, in making these estimates, to have in mind what seem to us to be some definite features of MISs, the primary one being that they are intended for management and should be regarded as part of the management system. The elements of information systems (other than MISs) can be specified by listing information tasks comprised in a general automated system.

Data collection: Observing and recording events and transactions.

Data conversion: Changing data contained in an original document into a more suitable form for processing or storage.

Data transmission: The process of moving data from one location to another by physical or electrical means.

Data representation: Representing data in a machine-readable form so as to facilitate processing.

Data organization: Arranging data in the form of files, records, so that they can be processed and retrieved efficiently and economically.

Data storage: Storage of data on appropriate media so that they will be easily accessible to the central processor.

Data manipulation: Selecting, sorting, merging, and/or editing data so as to facilitate further processing.

Data calculation: Performing various arithmetic and logical operations on data so as to produce desired information outputs.

Information retrieval and display: Retrieving information, or processed data, from information storage, and making it available in the proper format and medium at the right time to interested users. (Dippel & House, 1969, pp. 5-6).

In planning and budgeting information systems which give great attention to specific aggregations of data, however, the functions of organization, manipulation, and calculation must include such extensive filtering of data that not all data are passed on. These systems may also include various aggregation routines involving crosswalk procedures between data structures. But because this process merely defines, collects, and transmits data, in our view it is not an MIS. Authentic management information systems are directed toward the accomplishment of specific tasks or the support of specific decisions or kinds of decisions. These are systems that are obviously constrained, therefore, by the responsibilities and functions which are assigned to officials and agencies.

Another important consideration is that MISs are not comprehensive, nor are they the total integration of all organizational subsystems. In any complex organization, whether public or private, the range of organiza-

tional functions is simply too great for any single MIS designer to have command of the information needs of administrators or managers for the full range of decisions to be made. Resorting to the use of a sufficiently large staff of diverse functional experts presents severe coordination problems, and as Dearden (1972) pointed out, "If any of the MIS people are competent to tell the functional experts what [they need], they should be in the functional area" (p. 96). In short, comprehensive management information systems are a mirage because no complex organization has or would tolerate an all-powerful, all-knowing central management. Real-world management information systems are limited in scope, and provide particular decisionmaking points within an organization with limited sets of homogeneous information.

Further, an MIS is not merely computer-based activity. In the state budgeting process, an MIS may not even require the application of computers and automated data processing systems. As larger amounts of data are reported, some use of automated data processing may facilitate data handling and analysis. The development and review of higher education budgets, however, do not generally require quick retrieval of data, and thus on-line systems do not have a high priority. Some states have implemented automated budget data systems which tabulate state agency actions and recommendations on budget totals, but these systems are used as record-keeping devices and not for data submission.

Systematic efforts to gather and report information constitute a notable development for the state-level administration of higher education. But the most important achievements in automated management information systems in higher education are most likely to be at the institutional and operating levels--in admissions, purchasing, libraries, and other business operations. With respect to budgeting, the most significant developments regarding information will lie, with few exceptions, not in the implementation of automated data-processing technology, but in attempts to refine and use the information provided by improved information gathering and reporting procedures.

3.

Information and Analysis Development in State Agencies: An Overview

Most state budget review agencies examined in the course of this study indicated that they had certain information deficiencies. Most identified the difficulty of getting adequate information for conducting a satisfactory review of institutional budget submissions as a significant problem, but few considered this the most critical issue they faced in recent budget cycles. Other concerns, primarily the highly constrained resources of most state governments, have extremely high saliency at this particular time, and in addition, most state agencies have limited capacities to devote to information gathering and analysis.

The information gathered by state agencies, except perhaps for state higher education agencies, appears to be specifically addressed to the activities and functions they perform. Because agencies usually cannot afford the luxury of maintaining a comprehensive information system and the associated automated data processing resources, such activities as budget development and review rely on a virtually independent information gathering and distribution network. The end result is that budget requests and the entire process of review are largely self-contained. Budget request documents and supporting information form a single package. Some new information may be injected from time to time during the course of hearings and negotiations, but for the most part the information base for analysis and review is set in the call for budgets, subsequent instructions, and the submitted requests. Information for use during

budget execution may require separate submissions of information, but it remains essentially isolated from the budget development process. The use of automated systems for submission of information is extremely limited, although it is becoming quite common for the review process within individual state agencies to involve machine-readable records and automated data processing in recording the changes and recommendations over the course of that agency's budget review.

Significant exceptions to these generalizations will be pointed out during the course of the report. The generalizations made above must also be qualified because they were formulated from evidence gathered at one particular point in time--the year 1974 and the review of the fiscal 1974-1975 budget then in progress. At the present time, these same agencies are working on their 1976-1977 budgets, and in most instances two additional budget cycles have passed since our review. There also are indications that many states recently have become substantially more involved in statewide information collection and quantitative analysis of institutional budget requests.

Generalizations about administrative activities in the 50 states will almost always be wrong because of the subtle distinctions that slip through anything but a detailed analysis and description, and yet they may also be right because at least one state will be doing the exact opposite of another. Furthermore, in approaching overall trends in information use in terms of the practices of specific types of agencies, there is always the possibility that any description will fall short of complete accuracy because the roles of executive, legislative, and higher education agencies vary so widely from state to state. It is also impossible to divorce information and analysis of budgets entirely from agency activities in other aspects of budgetmaking. The use of special study commissions and task forces, and the development of new categories for appropriations in the budget bill, are clearly substitutes for reforms in the handling of information because often these procedures produce the same results that can be achieved through the routine

gathering of more information and the application of new forms of analysis. However, some consideration of the overall norms of activity in regard to information are in order as a basis for considering more specific activities.

Accompanying the vast differences between state higher education governance structures and procedures are very different general attitudes toward information collection and disclosure at the state level, which produce very different information environments. In some states, for example, salaries of public officials, including those of university presidents, are fairly widespread knowledge and may be the subject of regular public attention in relation to either general or specific fiscal issues; in other states, such disclosures are not generally made. In one state, salaries of public university presidents and legislative staff directors were neither general public knowledge nor made available to researchers for this study.

Personnel systems are the source of other variations in the kind of information available at the state level. In a few states (Texas and Virginia, for example), personnel records were maintained at the state level, and detailed information on individual faculty members were made available to state agencies, although the data supplied seemed to play very little role, if any, in the budget formulation process. In other states, the mere suggestion of such a file at the state level would have been unthinkable. We mention these differences not to suggest approval or disapproval of one practice over the other, but rather to illustrate the wide variations in what different states consider the proper province of state agencies in maintaining and providing access to information files.

EXECUTIVE BUDGET AGENCIES

Although all state agencies may approve the form and substance of budget instructions, the executive budget office is usually the issuing agency, and it

therefore has a key role in determining information submissions to the state. Information from institutions obviously can be requested outside the more formal process of budget instructions and subsequent budget submissions, but the formal instructions lay most of the groundwork for the information on which technical reviews will take place. During the course of review, questions or issues may arise which require other information. The executive budget office, in issuing its instructions, is perhaps in a better position than the legislative staff to satisfy its information demands because it very often specifies most of the substance of the budget instructions. Legislative staffs also may have the opportunity to specify any data they feel will be required, but in practice they usually depend very heavily on the executive budget office.

Currently, executive budget offices are quite widely requesting both more information on institutional operations and also more detailed information, that is, information at a lower level of aggregation than they have traditionally sought. This is especially true for the information asked of doctoral-granting and research universities, which generally have more complex operations and have not traditionally submitted data to state agencies on the complete spectrum of their activities and sources of revenue. Information which calls either for new classifications, such as program categories, or for information that has never before been gathered on educational outputs and the target groups for educational services, is in some instances being required from all institutions. Data schedules are usually devised in which to display these data, and instructions are given for their inclusion in the institution's budget submission. A request for new data often signals a new approach to budget review in the form of a shift to formula or program budgeting, or in the case of more incremental changes, a request may merely be a tactic to keep the institutions off balance.

Many of the requirements for changes in categories and types of information are associated with the implementation of program budgeting. Several executive budget offices in states which were leaders in program budget

development have now pulled back substantially from attempts to budget higher education on a program basis in anything more than a superficial way, such as simply continuing the use of the program categories. California, New York, and Pennsylvania are states which mounted substantial efforts to do program budgeting (see Schick, 1971) that have now been largely abandoned. Vestiges of the program budgeting effort remain in the form of information categories used either in the appropriation bill or in budget requests. These program categories are in use at highly aggregated levels. In New York, for example, their use seemed to relate more to an interest in splitting up the traditional lump-sum appropriation to higher education than to program budgeting.

At the same time, in several other states in the 17-state sample, executive budget offices were taking steps to move exclusively to program budgeting or were developing program budgets in tandem with the more traditional budget format. This results in a substantially higher information load during the process of budget development for the agencies reviewing budgets. In a few states, two governors' budgets are produced--one in program format and one in a format more related to the traditional practice of review, recommendation, and legislative appropriation. In at least one state, Connecticut, the governor's budget in program format was developed from parallel institutional program budget submissions which accompanied the traditional object of expenditure budgets. There was no indication, however, that the program budget played any role in decisions during the formal review process. The budget was informational; it displayed a state expenditure plan by program, and showed what might be termed a "reconstructed logic" for the budget as opposed to a "logic in use."

Because of their limited staffs, executive budget agencies have little capacity for engaging in special analytical studies of a nonroutine and ad hoc nature. In Wisconisn, the governor and the legislature mandated the University of Wisconsin Central Administration staff to complete certain "special studies" and include them with their budget submission for the following biennium.

The University of Wisconsin Central Administration, having a much larger staff than the state budget agency, and having access directly to relevant information, was in a better position to carry out these studies. The executive-legislative mandated studies (ELMS) resulted in reports that were more than just the submission of data; they involved in some instances the evaluation of proposals and proposed program activities designed by executive and legislative budget review agencies. In this particular case, the request for the studies had been an outcome of a prior executive staff analysis.

The staffs of governors' budget offices have grown over the last few years, however (Schmidtlein & Glenny, in preparation), and some of these staffs have significantly increased their analytical capacity and resources. Nevertheless, in most of the 17 states examined, the number of persons reviewing budgets for the governor has kept pace only with the growth of state services; these staffs remain small and do not usually include individuals with highly analytical or research backgrounds or experience in statistical analysis and quantitative techniques. The size of these staffs does not generally allow, therefore, for the review function to be specialized beyond that of assigning individual staff members as budget reviewers to doctoral-granting universities, state colleges, or community colleges.

Research and analytical backgrounds are more likely to be found on performance audit staffs that have been established in the executive branches of some states. Such staffs, however, even when they are in the proximity of budget review staffs, have difficulty relating their efforts to budgetary matters because their studies often tend to lack timeliness and relevance.

LEGISLATIVE BUDGET AGENCIES

In all but a few states, the governor is nominally responsible for the preparation of a comprehensive state budget. The executive branch, therefore, is most often the source of changes in information requirements, as

well as of other reforms in the budget process. But legislatures may also exercise a direct role in information and budget review reforms by legislating specific budgetary procedures (as in Hawaii) or by assigning the responsibility for certain budgetary functions to a coordinating agency (as in Illinois, Texas, and Virginia). By establishing their own budget review staffs to assist them in taking a more active policy-setting role, legislatures also add their own information requests to those information demands already placed on institutions.

Legislative action on the budget in general is often characterized by heavy dependence on the executive branch, both for policy direction and information. Legislative budget committees have traditionally depended on budget hearings and informal sources of information for indications of institutional competence and credibility and on spot checks for budget control. As a court of last appeal on budgetary matters, the legislature is likely to be concerned with very specific and concrete issues, not general questions of policy. The hiring of staff analysts has increased the legislature's capacity to go beyond these spot checks and to develop a policy context within which responses to specific issues can be made. Consequently, we found legislative budget staffs growing much more rapidly than the corresponding executive staffs. Nonetheless, with the exception of those state legislatures that actually prepare comprehensive state budgets on their own, or are virtually coequal with the executive in developing such a budget, legislative budget review is not comprehensive, nor does it often propose alternatives. In the main, it continues to consist primarily of checking the implications of executive proposals. Of course, where the legislature is a coequal in developing the state budget, as opposed to merely adopting it, legislative information demands may be directed toward comprehensive programmatic information.

In several states, we found examples of legislative staffs actively involved in requesting additional information as a part of the budgetary process. For example, in Colorado, the Joint Budget Committee worked through the Commission on Higher Education to gather and analyze

information on departmental faculty workloads. In Michigan, the legislative fiscal agency staffs requested substantial amounts of additional budget and planning data from institutions in an organizational format that would support their review, conducted differently from that of the executive budget office, which relied on programmatic data. As mentioned above, the Hawaii legislature, through legislation, has established a comprehensive Planning-Programming-Budgeting System (PPBS) for state program and financial management. This system, which requires the development of program information and program analysis resources, was first used in the 1973-1975 fiscal biennium. In Washington, the state legislature is developing the Legislative Evaluation and Accountability Program (LEAP), a computerized information system which provides budgetary planning and expenditure information to the legislature as an aid in preparing the budget and monitoring public expenditures.

Excepting those state legislatures which traditionally have been the dominant branch of state government, there is currently a rather broad reaction against executive dominance and a move toward strengthening legislatures. The studies and proposals of the Citizens Conference on State Legislatures (1971) support this trend. Expanding staff and improving systematic information gathering are always major components of these proposals for strengthening legislative capabilities. There is, of course, much for these legislative budget staffs to do if they merely respond to the initiatives of the other budget participants. In addition to the proposals of the governor's budget, which usually receive most of their attention, they must also react to the details of institutional requests (or of a statewide governing board) and possible formal or informal recommendations of a coordinating agency. Even when legislative staff do not officially receive the initial institutional budget requests submitted to the executive budget office (as in the federal process, where agency requests do not go to the Congress), these requests are usually available informally and are in virtually all cases much more informative about institutional plans than the governor's budget.

As guardians of the state treasury, legislative interest in controlling spending continues to influence the style of legislative budget reforms very heavily. Changes in the format of information submitted with budgets frequently are tied directly to the format of the appropriation bill. Often, their purpose is to split up a lump-sum appropriation rather than provide the opportunity for programmatic review by the legislature. In New York, agreement was reached to relax restrictive personnel and allotment controls on the State University when the university's appropriations were made in the seven categories of NCHEMS Program Classification Structure. Legislatures also have become interested in expanding their fiscal postaudit function to include or encompass performance audits of agency operations. The legislative auditor of the Hawaii legislature has conducted performance audits in higher education that have resulted in formal reports and recommendations (see the discussion of the Hawaii budget process in Chapter 4). The Joint Legislative Audit and Review Commission in Virginia has also completed a performance evaluation of the state's community colleges. The number of performance audits that have actually been carried out on higher education activities is fairly small, at least in those states we observed, and certainly the coverage of these audits has been limited. However, there appears to be growing interest in using these studies to focus legislative interest on substantive policy matters.

Performance audit staffs are likely to be further separated from budget review in the legislature than are the performance audit staffs in the executive branch. It appears that legislative performance audit staffs are more likely to have done studies on higher education than are executive performance audit staffs (Glenny, et al., 1975).

HIGHER EDUCATION AGENCIES IN THE STATES

With the exception of three states (Delaware, Nebraska, and Vermont), all states have a state-level coordinating or governing board for public higher

education which could play a role in budget review. Even though they may not have formal budget review authority, these boards and their staffs may still have a role in state-level information collection or in establishing analytical bases for budgetary review. Although the budget-related activities of these agencies range across a broad spectrum, it is essential to draw at least the minimal distinction between state higher education agencies: some are statewide governing boards and some coordinating boards. Because of their inherent responsibilities, governing boards always have statutory budget authority. They also are able to take fundamentally different actions in developing information bases.

STATEWIDE GOVERNING BOARDS

Many statewide governing boards actually develop budget requests for the governor and legislature instead of serving in the capacity of first level of state review, as do coordinating boards. In most instances, institutions under a statewide governing board do not submit separate formal budget requests to be subsequently reviewed by executive and legislative budget agencies. Statewide boards usually consolidate or aggregate these institutional requests, hence campuses may or may not be identified in the statewide governing board's budget request. These boards and their staffs tend to play a more active role in designing the format of the request and its substance, but in this respect there are great variations among the states. In Florida, for example, the institutions do not submit a formal written request to the statewide board for review, and in Kansas the institutional requests, although reviewed and changed by the statewide board, remain separate individual documents throughout the entire course of state-level review.

Statewide governing boards are likely to have much more operating and budgetary information than coordinating boards; in fact, they may be the producers and accumulators of this information for all the institutions. Consequently, in contrast to the information reforms

undertaken by a coordinating agency, which are likely to be consistent with its role as a "watchdog" or overhead control agency, the information reforms that governing boards undertake resemble the actions of an institution reforming its own internal administrative systems. In general, statewide governing boards have somewhat larger staffs than coordinating boards, and their staffs also have direct access to operating information because they or their supervisors have line-management responsibilities. It is also likely that the budget unit can draw support from an analytical studies unit. Staffs of three of the five statewide governing boards in our sample worked very closely with the budget preparation unit. Although there may be little need for the legislature to assign responsibility for statewide gathering of information where there is a statewide governing board, there is some indication that the growth of budget and analytic studies units in system administrations resulted from executive and legislative information requirements.

Because governing board administrations have a routine need for operating data, they may be more likely to use an automated information system of some type. Three states with governing boards, Florida, Mississippi, and Wisconsin, had information reporting systems with automated features of various types that made these reporting systems considerably more sophisticated than those of other states examined.

COORDINATING BOARDS

Virtually all of the coordinating boards studied have staff with responsibility for statewide data collection and distribution. In a few states, where data collection has been a longstanding effort of the coordinating board, a routine reporting system, usually manual, is in operation, in addition to the data reporting that takes place in the submission of budgets.

In carrying out their data collection responsibilities, these staffs are frequently involved in defining data inventories that include the budgetary support

information requested by other state agencies. Coordinating agency staff also are likely to have the responsibility for preparing data reports or comparisons of data for executive and legislative budget staff. One of their primary responsibilities, at this early stage of statewide data systems development, is implementing a common reporting system to provide comparability of data from assorted institutions. Some attempts at this were underway in fiscal 1974-1975, but the efforts have been expanded significantly with the adaptation of the information exchange program for the state level and the State-Level Information Base Project at NCHEMS. Increasingly, many more states have been availing themselves of the information exchange procedures and the accompanying workshops for institutions and coordinators. In Colorado, coordinating agency staff have served as consultants to institutions in their development of data systems, such as Resource Requirements Prediction Model (RRPM) and Comprehensive Analytical Methods for Planning University Systems (CAMPUS), but these systems were not as yet supporting budgetary requests.

On a routine basis, some coordinating agency staffs prepare average faculty compensation reports and unit-cost studies. These staffs may also be responsible for the development and revision of funding formulas. Of the states in our sample, a majority appeared to be reviewing and developing budgets on a nonformula basis or abandoning formulas altogether. Illinois, a state with a number of years of experience with a cost-based funding formula, is perhaps the most notable example of a state with a tradition of formula use which has now abandoned it. Five states, three of them with coordinating agencies, are making use of formulas (Table 1). In each of these, the coordinating agency has or will have a significant role in formula application. In Texas, the coordinating board actually certifies that institutional requests have been submitted in accordance with the formula devised through a statewide formula advisory committee. In Tennessee, the higher education commission collects the data for the determination of unit costs on which the formula is based. In Virginia, the Council of Higher Education will play a role in

Table 1

STATE HIGHER EDUCATION AGENCY (SHEA) RESPONSIBILITIES, 1974-1975

State	Kinds of SHEAs holding statutory budget review authority	70 percent of budget or more reviewed by formula	Develops budget or budget reviews	Prepares formal unit-cost estimates	Prepares faculty salary comparisons	Number of professional staff assigned to higher education budget
California	None*	Not app.	General review	Yes	Yes	0
Colorado	Coordinating	No	Detailed review	No	Yes	2
Connecticut	Coordinating	No	Detailed review	No	No	1
Florida	Governing	Yes	Develop budget	Yes	No	11
Hawaii	Governing	No	Develop budget	Yes	No	6
Illinois	Coordinating	No	Detailed review	Yes	No	5
Kansas	Governing	No	Detailed review	No	No	1
Michigan	Coordinating	No	General review	No	No	1
Mississippi	Governing	Yes	**	No	No	2
Nebraska	----------no coordination----------					
New York	None	Not app.	Not app.	No	No	0
Pennsylvania	Coordinating	No	Detailed review	Yes	No	4
Tennessee	Coordinating	Yes	Detailed review	Yes	Yes	7
Texas	***	Yes	Not app.	No	Yes	3
Virginia	****	Yes	General review	No	Yes	2.5
Washington	None	Not app.	General review	Yes	Yes	1.5
Wisconsin	Governing	No	Develop budget	Yes	No	31

Source: Glenny et al., 1975

* The California Postsecondary Education Commission, which superseded the Coordinating Council on Higher Education in 1974, is expected to review budgets in order to advise state officials on policy issues and to recommend general levels of support.

** The Mississippi Board of Trustees review of budget requests is general, but review of institutional operating budgets, which takes place before the beginning of the fiscal year, is detailed.

*** The Texas Coordinating Board does not have budget review authority, but has statutory authority to develop and certify the use of budgetary formulas.

**** The State Council of Higher Education for Virginia will have statutory budget review authority for the fiscal biennium beginning in 1976.

future revision of the instructions for formula use, thereby assuming some of the role once played by the executive budget office.

A questionnaire survey of the development of statewide information systems by Barak (1975) indicated that only two states (Ohio and Tennessee) met certain criteria for having fully developed state-level management information systems; several other states--Colorado, Georgia, Maine, New Mexico, North Carolina, Oklahoma, Oregon, and Washington--were reported to be well along in their development; and nine states reported they had no state-level management information system at all. California, Florida, Hawaii, Nevada, Rhode Island, Utah, and West Virginia were listed as nonrespondents. Our impressions from visits to 17 states do not contradict the general impression given by this survey--that centralized management information systems are far from fully developed in the states. However, the criteria used in the Barak survey for determining whether a state has an MIS represent such a high order of achievement that development efforts being made by state higher education agencies may be overlooked. The criteria used for the Barak survey were as follows:

- A formally planned, integrated information system that utilizes data generated by operational level programs to develop information that can be related meaningfully to the objectives or problems of the top level decisionmakers.

- A system consisting of analytical tools and/or programs encompassing the areas of finance, facilities, students, faculty, nonacademic staff, and academic programs.

- All the analytical tools or programs are at the fifth stage of development, that is (as defined in the survey instrument), information from these systems is being used for decisionmaking at the statewide level.

4.

Styles of Higher Education Budget Review

The budget process examines and explicitly or implicitly answers two essentially different questions during the course of review. It first addresses the question of whether the activities proposed by the institutions are properly costed out (what it costs to operate a university program) and secondly, it determines whether funds should be appropriated to conduct these activities (whether a university, or some segment of it, ought to be funded). The technical process of budget review is of much greater assistance in answering the first question than the second; some would argue that it cannot beneficially address the latter at all. Traditional budget procedures have been directed chiefly at the "costing" of agency activities, but almost without exception recent reforms in budget review have been directed at developing formal procedures for explicitly dealing with choice within the confines of the budget process.

STYLES AND DIMENSIONS OF BUDGET REVIEW

To generalize about state-level budget processes for higher education, it is useful to describe several styles of budgeting that were observed in the 17 states. Practice in some states may coincide precisely with one of these types, but it is far more common to find the elements of several types combined in a state's process. Thus, the styles described below are attempts at defining relatively pure forms of budgeting which embody

a particular set of budgeting principles and concepts. The styles are in two groups which coincide with the two dimensions of budget review: scope of review and review technique. Scope of review is described by the two categories, zero-base review and structured-incremental review, which distinguish between budget review approaches providing for review of items in the budget base and approaches which structure review around increments to the base, thereby virtually accepting a continuation of expenditures for base activities. Review techniques are identified with the application of various analytical techniques, whether applied to the base or only to increments to the base. The approaches in this group are the traditional *object of expenditure budgeting*, *performance budgeting*, *formula budgeting*, *programming-planning-budgeting*, and *tactical budget planning*.

The styles discussed here are intended to be useful analytically, and should not be taken to exaggerate the differences between states. They have also been selected to relate to differences in budgetary information requirements rather than to budget process outcomes. Although there are many differences between the various offices in their procedures and level of participation, the budgetary process in any state must still solve the same fundamental issues. The styles which have been defined are also intended to represent existing state practices rather than models for reform. In terms of the broad spectrum of practices described by Schick (1971), the vast majority of state budget procedures are heavily oriented toward control. Consequently, we are describing a set of arrangements which include devices for providing what is considered to be a sufficient degree of control over budget execution. In concentrating on the budget formulation process, the present study gives relatively little attention to means for exercising budgetary control. It should be obvious, however, that some review styles are more appropriate than others for exercising budgetary control and that, therefore, actual state procedures are often a blend of the review styles we shall describe. The emphasis on the budget development processes in the states may also change from year to year in response to changes either in revenue expecta-

tions or in the governance of higher education. Some of these changes in procedure may be relatively superficial, but the submission and review phases of the budgetary process are undergoing regular scrutiny for revision and improvement.

One characteristic feature of higher education budgeting in all 17 states is that the higher education request for general funds is a request for partial funding of its total budget. Unlike most other state agencies, public higher education has various sources of operating income. This is particularly true of the large doctoral-granting research universities, but it is also true to some extent for any institution which receives income in the form of student tuition and fees. Thus, in the higher education budget process in most states, institutions request a state appropriation which is the difference between their total budgetary needs for the coming period and an estimate of their other sources of revenue. Technically, this places the state in the position of funding a residual, with little or no control over nonstate funds. However, by virtue of various control devices in use at the state level, the institutions may realize relatively little discretion in expenditures from their nonstate support. Depending on arrangements for control, information demands concerning these nonstate funds are commonly an issue in determining an appropriate format for information submission.

SCOPE OF REVIEW

Structured Incremental Review. Virtually all governmental budget review involves comparisons of budget estimates with expenditures in the previous year, and in this sense review is incremental. Some budget submissions, however, focus attention on the increment over last year's appropriation by establishing cross-cutting review categories, such as the *adjusted base from the previous year, costs to continue, workload increases, and program improvements.* Review within each of these categories may proceed according to any of several methods. Review of selected

expenditures within the budget base is not necessarily excluded, but in this format emphasis in review is necessarily directed to the additional increments. In some instances, supporting information and documentation are almost entirely limited to justifying these increments.

Definitions of the expenditure items assigned to each incremental category differ among states, but in theory, assignment is straightforward. "Adjustments to the base" are negotiated, but would typically include costs of inflation and annualized costs of programs approved in the previous year less nonrecurring costs. "Costs to continue" consist of cost increases that will be incurred in continuing the activities included in the prior year's base. "Workload increases" are those cost increases necessitated by higher activity levels, such as enrollment increases, increases in library usage, and increases in information reporting. "Program improvements" and new programs are expenditures that arise from increasing the quality of service or adding new services.

Clearly these increments to the base may be justified more or less appropriately by different kinds of support information. Herein lies one of the reasons that budgeting methods are likely to involve a mix of approaches. Costs to continue may be more clearly represented in terms of objects of expenditure. Workload increases are most easily justified through formula factors or performance indicators. New programs and program improvement involve questions of new outputs and may tend to rely more on budget methods that consider program outputs, alternatives, and the relationship of the proposed program to institutional missions, goals, and plans.

Zero-Base Review. In contrast to review which explicitly assigns a lower priority to scrutiny of items for which appropriations were made in the prior year, some methods of review either make no distinction between funds for continuing activities and funds for new activities, or they make special provision for reviewing certain items within the base budget. In keeping with the times, more and more state budget review agencies are developing

procedures to periodically examine selected items in the budget base, but we do not mean to limit zero-base review to any one approach. In essence, central budget agencies merely have to establish the principle that ongoing activities are not self-justifying, and that some of these activities will be reviewed in each budget cycle as though they were new expenditures. Even though review may be somewhat more comprehensive, budgetary outcomes are still only incrementally different from previous budgetary outcomes. However, see Williamson (1967) and Bailey and O'Connor (1975) for a discussion and critique of incrementalism as an analytical concept describing the budgetary process.

Pyhrr (1973) describes a general method and approach for structuring a zero-base review, which he calls zero-base budgeting. This budget methodology has been applied in corporate planning and budgeting and was used to develop the entire executive budget recommendation for the State of Georgia for fiscal year 1973. The method's distinctive features are the presentation of an organization's entire range of activities in terms of "decision packages," and the ranking of these packages through cost-benefit analysis or subjective evaluation. Decision packages are identified either as different ways of performing the same function, or as the performance of a particular function at a different level of effort. A minimum level of effort package, for example, might be 50-70 percent of current operations, and additional levels of effort above this would be referred to in terms of a decision package.

BUDGETING TECHNIQUES

Traditional Object of Expenditure Budgeting. The most straightforward method of presenting a budgetary plan is according to the items for which funds will be expended. This ensures that all expenditures will be identified, since they are expressed in terms of the planned purchases of various concrete services and items. The federal object of expenditure classification has been noted as a typical framework for summarizing and aggregating the expenditures of any governmental agency (see Chapter 2, page 15).

States reviewing budgets in terms of object classes use very similar categories. However, for a budget to be reviewed in terms of objects of expenditure, it is necessary to provide data in substantially more detail within each of these categories. As an example, see Exhibit 2 for a listing of the object categories and the detail used by the Department of Finance and Control of the State of Connecticut. In addition, typically included are supporting schedules for personnel, listing each position by institution and department with the present and proposed salary level, and position reclassifications. Because a very large portion of a college or university budget is determined by personnel costs, this is the category for which detail is most important.

Review of higher education budget estimates in this format does not require a sophisticated understanding of educational methods or programs. Government agencies may differ in their use of various inputs, but the principles of review will be the same for any agency or bureau. A comparison with the previous year's expenditures in the same format is perhaps more important with this approach than with others. Personnel costs are reviewed in terms of the number of positions listed and additions; merit and anniversary salary increases; promotions; and the historical salary lapse rates resulting from personnel turnover. In general, budgetary issues are related less to programmatic considerations than to the personnel regulations and procedures specific to the particular state. Guidelines may also be promulgated within the reviewing agency for evaluating the reasonableness of institutional requests. Experienced budget examiners use their judgment and intuition in determining how large an increase an institution or an agency can reasonably handle, and the appropriate relationships among expenditures for various categories. Virtually the entire budget is reviewed against the estimated expenditures for the prior year. Rules of thumb and standard operating procedures that apply to all agencies can be used as well in reviewing higher education budgets.

Exhibit 2

STATE OF CONNECTICUT OBJECTS OF EXPENDITURE CLASSIFICATION

CURRENT EXPENSES

Personal Services
- Permanent full-time positions
- Other positions
- Fees
- Overtime

Contractual Services
- Advertising
- Printing & binding
- Subscriptions
- Fees
- Licenses
- Travel in state
- Travel out of state
- Transportation of persons
- Freight, cartage, & express
- Utility services
- Telephone & telegraph
- Laundry, dry-cleaning, & towel service
- Rents & storage
- General repairs
- Motor vehicle repairs
- Insurance
- Board & care in other institutions
- Sundry operating expenses
- Fees for outside professional services
- Motor vehicle rentals
- Data processing rentals
- Data processing services
- Postage

Commodities
- Agricultural, horticultural, & dairy
- Food
- Clothing
- Personal supplies
- Maintenance supplies

Laundry, cleaning, & disinfecting
Drugs, medicines, & serums
Medical & laboratory supplies
Fuel
Motor vehicle supplies
Office supplies
Educational, religious, & recreational
Data processing supplies
Miscellaneous
Repair materials
Commodities purchased for resale

Sundry

Source: State of Connecticut. Department of Finance and Control, 1974.

Examples of such rules of thumb are that:

- An agency usually cannot make responsible use of a budget increase of more than 15 percent over what it got last year.

- Agencies always overstate their budget estimates, and therefore trimming back is always required.

Because of their well-known control features for application during budget execution, budget data in object of expenditure classifications often supplement information provided in some other format in budget submissions. Summaries limited to the primary categories (personal services, contractual services, and supplies and equipment) may suffice for these purposes, and usually appear in the appropriations bill. The result is called a "line-item" budget, but it should not be concluded that the review process was restricted to the review of such categories. It is possible that it was, but a budget request can be reviewed functionally or programmatically, and in order to set up corresponding allotment accounts, it can retain the object of expenditure implications for eventual inclusion in the appropriations act.

Performance Budgeting. The budgetary question--what it will cost an agency or institution to operate for another budget period--is answered in an object of expenditure review by considering the kinds of expenditures an agency plans to make during the budget period. This question may also be answered by estimating the cost of activities planned for a future budget period on the basis of currently incurred activity costs or workloads. This approach is widely referred to as performance budgeting because it involves explicit consideration of the input-output on production relationships in an agency, whereas object of expenditure review is restricted to a consideration of agency inputs.

The outputs of most public agencies, not only of higher education, are diverse and difficult to specify; relating budget dollars to these outputs has not proved a satisfactory basis for either institutional formulation of budget requests or state agency review and revision of

these requests. However, a budget estimation can be made by relating dollars expended to units of the process activity rather than to a specific output. Thus, while it may be difficult to relate expenditures to educational outputs such as increases in student knowledge or level of skill, it is possible to relate expenditures to units of educational activity--such as a full-time student enrolled for one year, a student earning a credit-hour, or a professor spending a contact-hour with a student. The common units of educational activity used in higher education budgeting are the full-time equivalent (FTE) student, that is, a full-time student enrolled for one year, or the equivalent in terms of part-time students, and the student credit-unit, that is, a completed semester or quarter credit-hour by one student. Both student-years and credit-units, as activities, can be specified more precisely by level, discipline, or instructional program. Completion of a degree is frequently suggested as a unit of activity or output, but it was not in use in any of the states in our sample.

During budget review by state agencies, as opposed to budget formulation or development by institutions and systems, performance budgeting is characterized by the application of activity and workload measures as indicators of the reasonableness and justifiability of an institution's request. Frequently, these measures, or indicators, are applied ad hoc during review, and they may not be specified in budget instructions as the basis on which institutions should determine their budgetary needs. When they are so specified, they become the factors of budgetary formulas. The budget process then becomes sufficiently different that we have treated it as a distinct approach to budgeting. Budget instructions may request that specific activity measures, usually in the form of activity-related workloads or costs, be calculated as a part of the budget submission--or the reviewing agency itself may calculate them. The use of these measures as checks or indicators, rather than as norms or standards, is the significant feature of performance budgeting. Because of the selective character of budget review, among other reasons, it may be important for state-level budget agencies to keep budget

submitters somewhat in doubt as to the exact criteria used in technical budget review.

Commonly, performance measures relate levels of instructional or other activity levels either to positions (faculty-student ratios, for example), in which case they are referred to as workload measures, or to expenditures (dollars per student credit-unit, for example), in which case they are called unit costs. Although these measures are usually calculated from data in budget submissions, they may not be a true representation of conditions in the institutions, both because of unfilled but authorized academic or administrative positions, and the myriad of cost-accounting conventions that must be specified in the absence of elaborate cost-recharge systems. Nevertheless, these indicators do allow comparisons of institutions, and review agencies may attempt to promote efficiency by basing budget recommendations on the budget levels of the least-cost institutions. This is not always possible because of fixed costs or costs associated with initial program or institutional development, and the review agency may simply base its budget recommendations on projections of an institution's own performance indicators rather than on the lowest in the state or on the state average.

Formula Budgeting. A long-established method of demonstrating budgetary need is by means of budgetary formulas in which agreed-upon cost standards--input-output, or input-input ratios--are used to develop budget estimates. Whereas all budget development processes use such standards or guidelines, certain features set some budget processes apart such as the widespread legitimacy attached by all parties to the standards used in the process, and the fact that such relationships are used to develop virtually the entire operating budget request. Thus, a formula budget process involves more than a reference to some standard student-faculty ratios or student credit-hour unit costs. The budgets for instruction, as well as for other functions or programs, are developed with these standards, and then once developed these standards

are accepted, in principle, by the state-level budget review agencies. There will, of course, always be instances when the full formula-generated amount may not be funded because of resource limitations. But in this event, the formula amount is nevertheless regarded as legitimate, and there is general recognition that funding has been deficient.

The formula concept is best illustrated by giving some examples of basic formulas. By far the most common are those that estimate budgetary requirements for some level of activity by multiplying estimates of future activity levels by a unit workload or cost factor. Three examples of formulas of this type used in budgeting instructional costs are shown in Exhibit 3 (see Meisinger, 1976, for other formula examples). Budgets for support areas, such as general administration, may use formulas in which numbers of administrative staff at various levels per FTE student are used as workload factors. Operation and maintenance of plant budgets are frequently determined by a formula in which the activity level is estimated in square feet of floor space multiplied by a standard cost factor in dollars per square foot, possibly specified for floor space of various grades.

Although there are numerous variations among formulas, the formula concept is a simple one; the conceptual and practical difficulties are introduced by the conventions and procedures for determining workload and cost factors. Each state, and perhaps each type of institution, may develop its own unique units of measurement for an activity in addition to its own conventions for mapping these activities into budgetary expenditure classifications. To use formula budgeting, each educational activity and support activity to be used as an element in the formula must be assigned to a budgetary expenditure classification. It is clear that unless a very complex formula is devised, the number of activities (elements) to be specifically funded by the formula will be quite small. In the instructional area, for example, the only activity generally recognized is instruction; the formula gives no explicit recognition to departmental research as an activity. Furthermore, how activities are

Exhibit 3

THREE FORMULA METHODS FOR DEVELOPING BUDGET ESTIMATES OF INSTRUCTIONAL COSTS

Input variables	Formula parameters (norms, institutional, segment, or state estimates)	Formula output
I Projected enrollments	Student-faculty ratios, average faculty salaries	Total faculty salaries
II Projected student credit-hour production	Average student credit-hour load, student-faculty ratios, average faculty salaries	Total faculty salaries
III Projected student credit-hour production	Direct instructional cost per student credit-hour	Direct instructional costs

specified can lead to a great many formula versions. Formulas for the instructional area might distinguish between total student credit hours produced at various levels--lower division, upper division, and graduate--based either on student level or course level. These levels might further be broken down into discipline or program areas, according to the HEGIS taxonomy, and different workload factors or costs could be applied to each of these activities (such as, producing a student credit-hour in lower division history, or producing a student credit-hour in graduate anthropology.) Thus, a very simple formula structure is easily transformed into a calculation problem that most budget agencies would not tackle without the aid of computers.

The only other formula methodology in use in the 17 states was one generally known as the "base formula," in which the estimated expenditures for the various support functions are determined as a standard percentage of the instructional and departmental research budget, which itself is determined by a workload-factor formula. Use of the base formula is by now relatively limited; it is not, of course, a method for budgeting instruction, which forms the largest portion of any institution's operating budget.

In our estimation, a complete formula process must include these fundamental characteristics: a stable method for determining the workload or cost factors to be used in the process; the use of formulas to develop budgets; and the widespread acceptance of the formula-generated expenditure estimates by all or most of the participants in the process, including the legislatures which make the budgetary appropriations.

A recent survey by Gross (1973) reported that 25 states were employing formulas in budgeting for higher education. Judging from our observations during the course of this study, many of the states designated by Gross, and perhaps by themselves, as using formulas, are relying on budgetary methods which are closer to performance budgeting methods or another budgeting methodology. Commonly, the factors used to estimate

budgetary requests have an ad hoc development; they are used to test the reasonableness of requests rather than to develop them, and the resulting budget appropriations bear little consistent relation to any formula-calculated request. A unique application of formulas is found in the State of Washington, where institutions use budgetary formulas to develop an instructional budget and a complement of faculty positions comparable to that in a top-quality private institution. Since the inception of this practice, however, no institution in the state has ever been budgeted at these levels, which are simply used as a standard against which actual funding levels can be compared. Most Washington institutions were funded at about 70 percent of formula for fiscal year 1975. An increase in the level of funding in relation to the standard is interpreted as an improvement in quality, and a decrease in the level of funding is regarded as a deterioration of quality.

Once a formula structure has been devised, its application in the budget process has just begun, for there remains the crucial task of determining the workload or cost factors to be used. These determinations can take place in a number of ways, but they almost invariably involve both a statewide advisory group of representatives from institutions to be affected by the formula, and the state agencies that review the institutional budget requests. In essence, there are two bases for determining formula factors once the structure of the formula has been specified--norms or desiderata which are determined either from practice in other states or from some general sense as to what constitutes good educational practice, and measures of existing conditions in the state. Either of these approaches may involve extensive study directed toward developing either a set of fixed factors or the process by which such factors can be determined for each budget period. Although some states continue to use formula factors that are really norms rather than historical relationships, there appears to be a trend toward the determination of historical unit costs, and continual improvement in the data systems that make it possible to measure these costs.

Because of the considerable time spent in developing a framework for a formula and appropriate factors, budget review under a formula process is likely to be simplified. State-level budget activity for some participants may only involve certification that approved formulas have been used in developing budget requests. Of course, in no case is the entire budget of an institution or system of institutions based entirely on a formula; requests for certain functional areas and requests for new programs may be outside the formula. Adjustments for inflation and other technical factors, such as fringe benefits, also require review. Even though negotiation and ultimate reduction of the formula-based request is required under this approach to budget development, the formula structure still provides the basis for discussion and the framework within which adjustments to budgetary totals are made.

Program Budgeting. The budget review styles described thus far do not tend to emphasize either the actual outputs of institutional operations or the specific objectives that institutions may attempt to achieve through expenditure of funds. A consideration of outputs or objectives is more likely when budget review is formally directed at answering the question: Should funds be expended to undertake the activity at all? This is a question of choice, not of costs alone, and it is intimately connected with constraints on the budget process which define the available options.

The review of new instructional programs or proposals for new activities may involve some consideration of objectives, but the major portion of the budget request deals with activities and programs already underway, and traditional methods of budget formulation give relatively little explicit consideration to whether base activities should be continued. The emphasis in the formal budget process is on costing out institutional plans and determining the budgetary requirements for what is largely a continuation of the current year's activities. The issue of choice, which confronts every budget process,

is handled less explicitly, and certainly less formally, outside the technical process, through negotiation and bargaining.

Interest in developing budget techniques which explicitly address the issue of choice in the budget process has been created, however, by normative proposals for budget reform extending over the past two decades, and recent declines in available state revenues. Because reforms are often not fully incorporated in the budgetary process, it is easy to fail to distinguish between proposals for reform and actual practice. Therefore, the descriptions that follow of Planning-Programming-Budgeting (PPB) and what we refer to as tactical budget planning draw heavily on the budget processes in Hawaii and Wisconsin, unlike the descriptions of budget styles discussed earlier, which did not reflect the practices of any particular state.

In considering public service outputs, both of the styles of budget review described below have introduced planning techniques into the budget process in one form or another. The distinguishing feature is that Planning-Programming-Budgeting systems modeled after federal civilian department systems rely heavily on the concept of long-range strategic planning that includes the specification of long-term goals and objectives, and on the indentification of alternative means for achieving these goals and objectives. The analytical base for this kind of planning is derived from normative, rather than descriptive, economic theories of utility and welfare maximization.

There are, however, other planning concepts which can be connected with the budget process, such as contingency planning, advocacy planning, coordination, innovative-futuristic planning, and tactical planning from a short-range perspective. In addition, rather than combining planning and budgeting, most state budget processes have explicitly sought some separation between budgetmaking and long-term strategy. The analytical base available for their planning alternatives is the much larger one of descriptive theory drawn eclectically from various disciplines. Although

this may appear to be merely a modification in the application of federal PPB or a reflection of various phases in PPB's development, differences in the substance of technical budget procedures between PPB and tactical budget planning are substantial enough to distinguish them as alternative styles of budgeting. While recognizing that the PPB spirit may be more important than the letter of the law, it is essential to deal with actual practices to the extent that they can be determined and described, rather than with the general principles on which reforms or styles of review are based.

Planning-Programming-Budgeting (PPB). The literature of analysis and commentary on program budgeting is so extensive, and the debate that has resulted over what PPB is and how it can be implemented has been so intense that it rivals religion and politics as subjects to be avoided in polite conversation. Without debating the conclusion of Howard (1973) that the federal style PPB is dead in the states, it is important to treat program budgeting as a formal alternative style in state higher education budgeting because many of the informational and analytical reforms in use or under consideration are derived from the federal style of PPB. Therefore, after reviewing what are generally understood to be the principal features and elements of program budgeting, and the attempts at implementing them in the states, the formal features of the budget process of the state of Hawaii will be used to illustrate the extent to which the principal PPB elements have been implemented in a specific situation.

Program budgeting involves five activities which tend to distinguish it from styles of budgeting already described.

1. Development of information and data structures built around programs (groups of activities contributing to a common objective) which specify measures of program objectives, outputs, activities, and costs.

2. Multiyear planning which results in five- or six-year projections of expenditures based on the implications of current decisions.

3. Formal consideration of alternative means of program output, production, and delivery.

4. Formal analytic studies, especially in the form of cost-benefit and cost-effectiveness studies, which support preparation of the multiyear plan and the consideration of alternatives.

5. Program postaudits which evaluate agency achievement of program objectives.

Various conceivable arrangements and time schedules have been devised to include some or all of these activities. The timetable designed for use in federal Bureau of the Budget review of civilian agency programs illustrates the cycle of activities and is shown in Exhibit 4.

The technical side of the PPB process involves preparation and review of various formal documents by requesting and reviewing agencies: the comprehensive and multiyear Program and Financial Plan (PFP), Program Memoranda (PM), Program Change Requests (PCR), and Special Analytical Studies (SAS). The special nature of each of these is readily apparent from its title, except for the Program Memoranda, which are summaries of major agency recommendations and decisions presented within a framework of long-run agency strategy, accomplishment of agency objectives, and available alternatives. (For a description of these documents see *Bureau of the Budget Bulletin*, 1967; reprinted in Lyden and Miller, 1968.)

Several states participating in this study had implemented various fragments of this package of formal documents, or were continuing to use various fragments, after having attempted implementation of program budgeting on a much more comprehensive scale. In the main, states have turned increasingly to the Program Classification Structure (Gulko, 1972) and the HEGIS Taxonomy

Exhibit 4

U.S. BUREAU OF THE BUDGET PPB TIMETABLE

MONTH	BUDGET PREPARATION ACTIVITY
September	Agency submits Program Memoranda (PMs) in final form, multiyear Program and Financial Plans (PFPs), the annual budget, and the annual legislative program to the Bureau of the Budget (BoB).
October-December	BoB reviews and recommends to the President; presidential decisions made and communicated to the agency.
January	Executive budget is presented to the Congress, major elements in the legislative program are indicated in the State of the Union message, the economic report, or in other communications to Congress.
January	Agency reviews special study program and submits proposed list for the calendar year to BoB.
January	Agency updates the PFP to conform to the executive budget.
February	BoB indicates to agency its request for Special Studies and for issues to be covered in PMs during the upcoming cycle.
February-July	Agency brings Special Studies to completion and prepares drafts of PMs.
April-August	BoB responds on Special Studies and draft PMs.
July-September	Agency head makes final decisions on his program recommendations; agency revises draft PMs; agency updates PFP, adding one year and making it conform to agency head recommendations.
Year around	Special Studies are begun, carried on and completed, as appropriate.

Source: U.S. Bureau of the Budget Bulletin No. 68-2, July 18, 1967. Reprinted in Lyden & Miller, 1968, pp. 440-441.

of Instructional Programs, the principal data structures to which states have turned in programmatically structuring higher education activities and outputs. In a few states, multiyear budget plans are submitted along with budget requests with virtually the same complement of estimates that are included for annual or biennial review. These projections of estimated budgetary requirements are commonly based on simple extrapolations of past trends, and are therefore given very little weight or attention in the process of budget review. Several states were using one or two isolated program budget documents, such as Program Policy Guidelines issued by a governor prior to submission of budget requests, or Program Revision (or Change) Requests included as a part of an institution's or system's budget submission. Where implementation is fragmentary, the overall budget process remains at most a hybrid process, and there is little to substantiate the view that these fragments have materially altered the decision process.

HAWAII

To avoid fragmenting their implementation of PPB, the Hawaii state legislature has written a full PPB procedure, closely patterned after the federal model, into the state's administrative law. Eventual implementation for all state departments began in the Department of Education in 1966 and continues for all state agencies at the present time. No other state visited during the course of this study (and we suspect this is also true of states not visited) has so fully implemented the formal procedures for doing program budgeting.

The availability of the program information described earlier in this chapter is a necessary, but not a sufficient, condition for a program budgeting system. Thus the development of a statewide program structure and its elaboration within higher education are the first order of business in implementing PPB. The necessary program structure is fairly well established in Hawaii and is based on the Program Classification Structure. The

Program Classification Structure has required very little additional refinement or expansion in order to be applied; instead it is the specification of program measures and activity indicators that have been much further advanced. It is noteworthy that the educational program structure adopted for state-level budgeting extends only to the seven campus-level programs indicated in Exhibit 5 and not to the level of instructional programs of, say, the HEGIS taxonomy. This structure gives approximately the same depth of program specification that has been developed for the other state departments or programs.

The primary budget submission for state-level review is prepared by the University of Hawaii Central Administration and consists of the first two years of a six-year Program and Financial Plan submitted as a single document. This is a highly structured document consisting of brief narratives covering objectives, descriptions, and the size and scope of Level II and Level III programs, and detailed quantitative descriptions of Level IV programs. In a prescribed format, the elements of these quantitative descriptions cover the program's objectives, its target group, client group, measures of program effectiveness, required physical resources, financial costs, program reviews, and a narrative explanation of the program analysis performed in establishing budgetary requirements. Every quantitative element, whether a budget estimate, an activity measure, or a measure of effectiveness, is projected for each year of the six-year period. The measures of effectiveness and their measurement units are shown in Exhibit 6. The budgetary plan prepared for 1974-1980 did not actually include the majority of these measures; those that were available are designated by a cross (+). It is evident that many of these measures are still in a state of development. Target and activity indicators shown in Exhibit 6 were much more widely available. Those that could not be provided are indicated by Na.

The formal analytical activities appear to be somewhat more limited, however, than the massive program plan would indicate. Although executive, legislative, and University of Hawaii headquarters staff are all involved in the development of the program structure and measures

Exhibit 5

FORMAL EDUCATION PROGRAM STRUCTURE IN THE STATE OF HAWAII

Level I. Formal Education

Level II. Lower or Higher Education

Level III. University of Hawaii, Manoa Campus

Level IV. Instruction

Organized Research

Public Service

Academic Support

Student Support

Institutional Support

Independent Operations

Levels III and IV are represented on each of the University of Hawaii campuses

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Source: State of Hawaii. The multi-year program and financial plan for the period 1974-1980. Submitted to the Seventh State Legislature, December 1973.

Exhibit 6

MEASURES OF EFFECTIVENESS AND UNITS OF MEASURE IN THE STATE OF HAWAII

Level I - Formal Education
- No measures indicated

Level II - Higher Education
- Average CEEB raw score of graduating class
- Total cumulative income earned
- Average alumni gift to higher education
- Number of people entering institutions of higher education
- Number of graduates who began not more than 5 years ago
- Alumni evaluation of worth of college

Level III - UOH-Manoa
- Average CEEB raw score of graduating class
- Total cumulative income earned during 5-10 years
- Average alumni gift to higher education
- Number of people entering as a percent of the eligible population
- Number of graduates who began not more than 5 years ago
- Alumni evaluation of worth of college

Level IV - Instructional Program
- Average CEEB ranking of entering freshmen
- Average CEEB raw score of graduating class
- Average GRE ranking as percent of average CEEB ranking
- Average national GRE ranking
- Merit scholars entering as freshmen
- Number of graduates that continue to graduate school
- Number of graduates that continue to good graduate schools
- Number of students graduating after 4 years
- Number of students graduating after 5 years

Number of students graduating anywhere after 5 years

Level IV - Organized Research

+ Amount of research funded from extramural sources
Average number of journal articles furnished per tenured faculty member
Average number of citations of faculty members' work
+ Average number of books published per tenured full-time faculty
Estimated economic value of discoveries, etc.

Level IV - Public Services

Income produced where fees charged
Income where fees charged as percent of cost of public offerings
Total attendance or average class size in other training
Public evaluation of quality of public offerings
Number of faculty hours donated to public offerings
Amount of fees earned for consultant projects
Estimated economic value of public services

Level IV - Academic Support

Degree to which overall program objectives are met

Level IV - Student Services

+ Attendance at intercollegiate activities
+ Income produced from intercollegiate activities
+ Participants in intercollegiate activities
+ Participants in intramural activities
+ Students receiving financial aid
+ Average amount of financial aid received by type of aid
Average amount of financial aid received as a percent of cost
Student evaluation of quality of student service
+ Income produced where fees charged
Number of graduates who obtain jobs through placement service

Level IV - Institutional Support

Degree to which overall program objectives are met

Level IV - Independent Operations

Degree to which this program's objectives are met

Degree to which this program makes a net contribution

Level IV - Program Target Group and Activity Indicators

INSTRUCTION

Target: Population--local county

Activity: Enrollment
Student credit hours
Weekly student contact hours
Number of courses
Number of classes
Semester hours

ORGANIZED RESEARCH

Target: Total state population

Activity: Graduate student enrollment
Number of projects
Scientist man years
Number of publications

PUBLIC SERVICE

Target: Total state population

Activity: Courses and curriculum--number of participants/students
Special and professional programs (number of projects)
Organized teaching (number of persons assisted)
Direct consultations (number of persons contacted)
Lib-industrial relations (number of persons)
Seminars (number of each)

ACADEMIC SUPPORT

Target: Enrollment

Activity: Enrollment
Number of faculty
Number of titles published
Materials added to the library (volumes)
Circulation (library)
Reference service (number of contacts)
Number of requests for instructional media

STUDENT SERVICES		
Target:	Enrollment	
Activity:	Enrollment	
	Number of financial aid applications processed	
	Number of students counseled	
	Number of applications for admission	
	Number of graduates	
	Number of bed spaces	
	Number of admission and records inquiries	
	Number of student-sponsored activities	
INSTITUTIONAL SUPPORT		
Target:	Enrollment	
Activity:	Total acreage maintained	
	Total buildings (thousands of sq.ft.)	
Na	Total dollar sales (bookstore, food, etc.)	
	Number of parking permits issued	
Na	Number of government vehicles maintained	
	Pieces of mail handled	
	Requests for duplication service	
	Number of pages reproduced	
	Number of faculty and staff	
	Total general fund	
INDEPENDENT OPERATIONS		
Target:	Total state population	

Source: State of Hawaii. The multi-year program and financial plan for the period 1974-1980. Submitted to the Seventh State Legislature, December 1973.

\+ = Measures of effectiveness and their measurement units that were available in the budgetary plan prepared for 1974-80.

Na = Target and activity indicators that could not be provided in the budgetary plan prepared for 1974-80.

of performance, the university staff is the only staff large enough to provide these analytical resources. For purposes of internal allocation and management, the headquarters staff prepares cost analyses and other studies. The first executive Program Memorandum on Formal Education, submitted to the legislature in January 1974, referred to Issue Papers that had been prepared on higher education access, residency status, enrollment in higher education institutions, and the limiting of higher education growth. A special analytic study was recommended to develop policies for controlling the growth of enrollments in the University of Hawaii system. The substance of this 60-page Program Memorandum is suggested by its major section headings:

I. Overview of Formal Education

II. Costs and Effectiveness of the Recommended Programs. (Some of the supporting data unavailable for the Program and Financial Plan is included here.)

III. Program Change Recommendations. (Aggregated budgetary implications of program changes are summarized. No details.)

IV. Emerging Conditions, Trends, and Issues. (Some alternatives such as the open university, special education, and computer-assisted instruction are discussed briefly.)

V. Selected Problems for Possible Study.

The performance audit function is well established and is the responsibility of the legislative auditor. Although the auditor has no budgetary responsibilities, his staff appeared to be at the cutting edge of changes in both the higher education program structure and the measures of effectiveness, and thereby directly affected the formal budgetary procedures. The legislative audit staff, a permanent staff, is also large enough to constitute an analytic resource to the legislature on higher

education--possibly more so than legislative appropriation committee staff, many of whom were temporary. Performance audits had been conducted by the legislative auditor's staff on the educational television station and on faculty workload standards (see Legislative Auditors of the State of Hawaii, *Audit of the Hawaii Educational Television System*, Audit Report 71-4, April 1971, and *Audit of the University of Hawaii's Faculty Workload*, Audit Report 73-2, February 1973). The budgetary implications of these audits were not apparent, although it was clear that both of the audits, especially that on faculty workloads, had been highly critical of the administration of the university, and thus had contributed to creating a less sympathetic audience for higher education budget requests.

Some qualification of the principal formal elements in use in the Hawaii system of PPB is necessary in order to properly understand the use of these documents and techniques in the budget process, even though there is no question that they exist. This is considerably more difficult in the case of PPB than in the case of performance budgeting because PPB is an attempt to radically reform the nature of the budget decision process. Even performance budgeting is quite frequently hybridized with traditional object of expenditure review, casting doubt on whether new procedures have altered the process of budgetary decision.

Schultze (1968) has said of PPB that no one should conceive of it as a system that makes decisions, and the same should be said of any of the technical styles of budget review that we have discussed. As various proponents of PPB have indicated, its purpose is to assist budgetmakers in making decisions by providing them with information and analysis and a context for making budgetary and policy choices.

Because our investigation of budgetary procedures did not extend to examining their impact on budgetary or educational outcomes, we make no evaluation of the budget process in any state. Nonetheless, our impression of the various budgetary participants in Hawaii is that a great portion of the information that was included with

the Program and Financial Plan had very limited utility within the prevailing decision framework. Although some of this data may have been used in the sense that it was looked at by examiners and officials, the link between fairly immediate budgetary consequences and the indicators of activity and effectiveness is so tenuous that its usefulness in budgetmaking is limited. Whatever else the budget review process accomplishes, it must produce a budget--an expenditure plan--and all plans are not necessarily budgets. To what extent the perspectives of those making budgetary decisions have shifted to the more substantive programmatic considerations is impossible to measure. The fact remains that enough cost and expenditure data is included in the program information provided to permit a fairly traditional object of expenditure review to undermine the programmatic perspective. The costs derived are based on accounting conventions and, therefore, do not allow for analysis of total social costs in the sense implied by cost-benefit or cost-effectiveness usually associated with PPB.

The staff activities necessary to maintain the PPB procedures in Hawaii are extremely time-consuming, and being tied to the budget timetable they must be completed on a fairly rigid schedule. Within this structure, the planning that takes place has the appearance of being relatively inflexible--dictated by the budgetary procedures and their timetable. Planning, as reflected in formal documents, is almost entirely of a rational-objective nature, and does not encompass a sense or spirit of advocacy.

Tactical Budget Planning. Unlike PPB, there is no system of procedures to serve as a prescription and point of reference for doing what we have called tactical budgeting. Wisconsin, whose higher education budget process has been selected as illustrative of this approach, was one of the first states to experiment with program budgeting. Admittedly, one interpretation might be that Wisconsin's budget procedures are simply operational program budgeting. However, without prescribing these

procedures as a recipe for carrying out program budgeting, we shall provide an informative contrast by pointing out a number of characteristics which distinguish tactical budget planning from PPB.

WISCONSIN

Wisconsin is an especially important state to study with respect to analytical and informational budget support activities because so many of these activities are documented in its budget process with staff reports and written communications. It should be noted that other states may be following similar procedures in a somewhat less formal manner. These formalities may at times distort or becloud for an outside observer the true nature of the choices being made and the parameters surrounding these choices, but they are nevertheless the unchanging matrix within which budgetary issues are shaped and refined.

As in PPB, information display and analysis are crucial elements of tactical budget planning. The range of options which these data and analysis inform, however, is considerably more limited, and the options are expressed as fairly immediate operational decisions rather than long-range goals. State-level budget review agencies work primarily with institutional (campus) data structured by a slightly modified Program Classification Structure combined with the HEGIS Taxonomy of Instructional Programs. The specific arrangement of these data, however, is dictated more by a budget device known as a Decision Item Narrative (DIN) than it is by any program structure.

Decision Items are identified through negotiation between the University of Wisconsin Central Administration and the Department of Administration, but represent essentially the incremental programmatic changes for which the university requests funding for the coming biennium. The Decision Item Narrative is the standard format and specification of supporting information used to describe these changes. Although Wisconsin has

followed a structured-incremental approach in higher education budgeting, Decision Items may refer to items in the base budget as a consequence of imposed productivity cuts. (The productivity cut in Wisconsin refers to the prior specification by the governor of a 7.5 percent base cut for the 1973-1975 biennium for which the university could request a reallocation through the DIN procedure.) Decision Items are analogous to Program Change Requests, but at a considerably lower level of detail. The biennial request for 1973-1975 included 42 summary Decision Items aggregated at the system level with an appendix in which these were disaggregated at the unit level in well over 200 unit Decision Items. Each unit DIN identifies the program, unit (campus), type of funding and budget change category, and gives a summary of budgetary requirements in terms of objects of expenditure. The narrative includes a justification built around the objective and an analysis of need, an analysis of alternative solutions, a proposal and intended accomplishments, and identification of potential performance indicators. A typical unit DIN is several pages long (4-5 on the average), and deals with expenditures of from several thousand to several million dollars.

Because the summary Decision Item Narratives cut across campuses, they are aggregated in terms of salary increases, workload increases of various kinds (enrollment, support functions, etc.), new academic programs, programs for minorities and the disadvantaged, and various specific program improvements (library, instructional programs). (See Exhibit 7 for a listing of the Summary DINs.) Consequently, they do not suggest the programmatic character of the underlying unit DINs. Exhibit 8 shows the unit DINs of an illustrative campus within the system. Note that unit DINs are cross-referenced to the summary DINs.

More extensive examination of budgetary issues in Wisconsin are frequently the subject of policy or issue papers prepared by the Department of Administration, the Legislative Budget Bureau staff, or the University of Wisconsin Central Administration staff. For example, for the 1973-1975 biennium, the Central Administration

Exhibit 7

SUMMARY DECISION (SD) ITEMS
University of Wisconsin System

SD#	Description	Requested by/for units
100	Academic Staff Compensation	$ 41,205,200
101	Classified Merit Steps	4,083,900
102	General Price Increase Allowance	1,318,500
103	Financial Aid Matching Funds	519,400
104	Potential Minimum Wage Increase	(Informational)
150	Productivity Program (Cut)	-21,558,700
	(Reinvestment)	15,676,900
151	Specific Price Increases	2,836,100
152	Dormitory Conversion	1,231,000
153	Equipment Replacement	644,900
154	Continue Special Programs	1,045,800
155	Vet/Public Patients (Hospital)	-8,000
200	Enrollment Funding	5,996,500
201	Phy.Plant: Full-Fin.+ Workload	5,658,400
202	Utilities and Heating Costs	4,198,800
203	Financial Aids-Incr.Workload	165,600
204	Debt Service on Acad. Bldgs.	12,506,500
205	Auxiliary Enterprises (Self-Supp.)	5,811,800
250	Additional Minor Remodelling	357,000
251	Staff, Equip.+ Oper.New Bldgs.	1,545,000
252	Fed.Indirect Cost Support	7,600,000
253	Computing Workload	823,000
254	Student Service Workload	314,300
255	Extension Contin.Educ.Enrollment	1,558,500
256	General Opns.+ Svcs.Workload	853,600
257	Instructional Svcs.Workload	2,487,600
258	Other Workload Increases	317,800
259	Univ.Hospitals Revenue Budget	-5,460,700
260	Fee Income Offset (Info. only)	(13,690,000)
261	Federal Funding Growth	14,000,000
300	Sea Grant Match/Marine Studies	417,300
302	Minority/Disadvantaged Programs	3,147,000
350	New Acad.Program Proposals	3,778,400

SD#	Description	Requested by/for units
351	Health Science Curricula	$ 3,690,200
352	Instructional Improvements	3,367,500
353	Wisconsin Idea, Ext.+ Publ.Svc.	8,951,300
354	Teaching Hospital Support	7,488,500
355	Field Stations and Farms	186,800
356	Affirmative Action for Employment	554,900
357	ETV Network Capability (per ECB)	453,800
358	Computing + Library Improvements	829,100
359	Improved Mgt.+ Support Programs	172,500
360	Student Services Improvements	612,700
361	Research Programs + Grad.Assts.	1,811,600
362	Other Program Improvements	570,000

Source: University of Wisconsin System 1973-1975 Biennial Budget Documentation, Book V, U.W. System Biennial Budget Request and Decision Item Narrative, August 1972.

Exhibit 8

EXAMPLES OF UNIT DECISION ITEMS
University of Wisconsin, Madison Campus

Description (+Summary DIN X-Ref.)*	Unit request
Required Base Cut for Productivity (SD 150)	-7,647,700
Restoration to Cover Fed.Match.Requirements (SD 150)	1,014,100
Accelerated Studies (SD 150)(3 yr.degree opt.)	778,700
Library Improvement/Statewide Resource (SD 150)	807,400
Restore Balance of Base Cut (SD 150)	5,737,500
Conversion of Res.Hall to Academic Use (SD 152)	144,200
Obsolete Equipment Replacement (SD 153)	436,200
Utilities (SD 202)	2,054,700
Small Scale Waste Systems (SD 154)	243,700
Specific Major Price Increases (SD 151)	270,000
Additional Funds for Minor Remodeling (SD 250)	125,000
Dept.Support for Fed.Funded Programs (SD 252)	4,000,000(PR)
Maint.& Custodial Costs of New Bldgs. (SD 251)	599,100
Operation of Animal & Volatile Waste Incinerator (SD 251)	122,900
Staff, Equip.& Operate New Bldgs. (SD 251)	442,900
Teaching Univ.Hosp.-Full Funding of Educ. Costs (SD 354)	7,488,500
Environmental Curriculum & Course Development (SD 350)	83,400
Improvement in Legal Education Progs. (SD 352)	565,000
Allied Health & Physician Asst.Progs. (SD 351)	563,900
Improve Undergrad. Health Science Instruction (SD 351)	645,600
Improve Basic Med.School Programs (SD 351)	1,004,700
New Advanced Med.School Programs (SD 351)	504,000
Campuswide Animal Resource Center (SD 361)	139,600
Improvements in Postgrad. Med.Education (SD 351)	216,200
Improvement of Instructional Media (SD 150)	258,200

Description (+Summary DIN X-Ref.)*	Unit request
Increased Opportunities for Minority & Disadvantaged Students (SD 302)	791,600
Improved Research & Instruction in Col.of Agr. & Life Sci. (SD 361)	743,000
Improvement in Instructional Use of Computing (SD 358)	367,600
Establishment of Statewide Public Service for Mental Retardation (SD 353)	578,000
SUBTOTAL (Certain items)	22,129,800
NET TOTAL (All items)	$23,078,000

* Summary Decision Item Number cross-referenced.

Source: University of Wisconsin System 1973-1975 Biennial Budget Documentation, Appendix, Book V, Unit Decision Item Narrative, August 1972.

of the university was mandated by the governor and the legislature to prepare 10 studies on various budget-related policy issues and to submit them with the biennial budget request. (In some instances, the policy issue had already been the subject of an issue paper or study by the executive or legislative staffs.) The result was a formally documented policy dialogue on the designated policy issues. The character of these studies can best be illustrated by indicating the subject of each study and summarizing briefly the questions to which the university was asked to respond:

- *User Fees.* Study ways in which user fees could be assessed to defray general revenue costs of noninstructional activities and use of educational facilities for noninstructional purposes. (The university had previously been directed by the governor to study the potential for raising additional revenue in intercollegiate athletics, intramurals, and other noncredit use of physical education facilities.)

- *Facilities Utilization.* Examine current and projected campus utilization, how utilization could be improved, and which campus should be closed. Develop criteria for maximum and minimum campus size and acceptable ranges of cost per student for various disciplines and instructional categories.

- *Physician's Assistant Program.* Develop an inventory of information on physician's assistant programs in other states and a model program statement.

- *Academic Program Evaluation.* Develop specific criteria for evaluating academic degree programs. Identify the range of academic programs which are to be offered at each institution. Establish criteria for minimum and maximum class size. Determine the number of comparable programs justi-

fied among various campuses within the University of Wisconsin system. Develop a plan for the equitable dismissal of faculty. Indicate the progress to date in elimination of unnecessary programs.

- *Plans for Wisconsin Idea Funds.* Indicate the efforts to date in addressing the broad questions of the extension (outreach) program's organization, coordination, and planning.

- *Student Employment Budgeting.* Develop a method for revising the budget and accounting system so that student employment becomes a separate Decision Item.

- *Center System (Community Colleges) Programming.* Study methods for improving high cost and/or underutilization of small classes at certain Center campuses. Set specific performance targets. Develop coordination plan with the vocational-technical campuses. Develop merger plan for low enrollment centers.

- *Educational Technology-Academic Computing.* Rejustify and specify budget request to take productivity savings and reinvest them in these two areas.

- *Physical Plant Study.* Reevaluate present method used to develop management objectives and workload projections on newly constructed facilities with outside consultants. Consider outside contracting and establishment of systemwide standards.

- *Excess Dormitory Capacity.* Respond to previous communications on methods for reducing dormitory capacity.

There is clearly much more detail in the tactical budgeting approach than in program budgeting. In program budgeting, the objectives of the instructional program of an entire campus are considered, whereas tactical budgeting is directed to the more discrete objectives of,

say, attempting to improve the instructional uses of computers or clarifying the goals of a new teaching hospital. Issue papers are related to budget options that are under consideration within the decision horizon or in the very near future. The papers are related to what appear to be the tactical issues of operating the university, rather than to the more global concerns of who should have access to higher education and how it should be paid for. The methods used in the various policy papers are eclectic; because they are identified with specific agencies and represent agency positions on various issues, they possess a clear sense of advocacy. A number of these issue papers, by the nature of the questions that they pose, require the university to consider various contingencies. In this way especially, they stimulate the institutions or the university system to respond tactically to a condition that may arise instead of merely providing an open planning framework within which institutions are more likely to respond strategically with more abstract organizational objectives.

As we noted of Hawaii's PPB system, the informational demands of the Wisconsin procedures also are great. Similarly, we have no way of really knowing the extent to which various kinds of information play a significant role in budget choices. It should be noted that budgetary information in Wisconsin can be related to both programs and objects of expenditure, and that detail for the latter is sufficient to support a traditional object of expenditure review as well. Within the university's budget planning section in the Central Administration there are two groups which prepare the budget submission. The budget preparation group handles the mechanics of data processing, including the rationalization of objects of expenditure with institutional programs. The planning and analysis group prepares the issue paper analysis and establishes budgetary procedures, criteria, and budget planning parameters. Although the manpower requirements are considerably greater, this arrangement provides for a definite, although minimal, separation between the routine of budgetmaking and the flexibility that planning activities require.

5.

The Context of Formal Budget Documents

The technical approaches to budget review discussed in the previous chapter are implemented primarily through requests for inclusion of data in the documents submitted by the institutions for state-agency review. These documents, because of time constraints and the limited size of review staffs, become the principal vehicle, albeit not the only one, of course, for channeling information to those who must determine the appropriation for public higher education. This chapter is in two sections: The first deals with requests from institutions and statewide governing boards; the second with the exchange of documents at the state level and the relationship of these documents to the original requests.

A discussion of the content of budget documents tends to emphasize the formal as opposed to the practical aspects of budget review. One university president interviewed expressed the belief that the outcome of the budget process in his state, the legislative appropriation, had relatively little to do with the technical budget review procedures. He felt the procedures were only a way of developing a rationalization for decisions made on the basis of political realities. Be that as it may, budget documents do give some indication of how state agencies review budgets. They also represent part of an agency's or institution's attempt to be accountable on budget allocation decisions, for these documents are, in one respect, a public statement explaining why certain budget choices were made. Although reformed budgetary procedures

do not decide budgetary issues, we have found it difficult to square the view that "New budgetary methods can't be used" with the apparent changes in state budgetary practice. A discussion of the consequences of these changes is reserved for Chapter 6.

INSTITUTIONAL AND SYSTEM BUDGET REQUESTS

In describing the content of formal higher education budget requests, we make a distinction between requests submitted to a governing board of a multicampus system and those submitted to a coordinating board. If institutional requests to a governing board are not subsequently reviewed by executive and legislative fiscal agencies, they were not considered for this report. Therefore, when a state has a statewide governing board, our discussion refers to the budget submission from the board staff to executive and legislative agencies. This is also true of multicampus systems, such as the University of California, where individual campus submissions to the multicampus system board are not reviewed subsequently by state-level agencies. In reviewing the budget requests of states with coordinating boards, the requests to the coordinating board are discussed, rather than the subsequent coordinating board recommendations. Where neither a coordinating nor governing board exists at the state level, we discuss the budget submissions that are reviewed by executive and legislative agencies, that is, the institutional or multicampus system requests.

Following the convention used in Glenny et al. (1975), requests of campuses with a single governing board that are grouped together during the process of review are referred to as either *aggregated* or *consolidated*. Aggregated implies that all campus detail is provided in such a way that the equivalent of an individual campus review is possible. Consolidated implies that all campus details have been lumped together in a multicampus total, and that therefore review of individual campus programs is generally not possible.

NONBUDGETARY CHANNELS OF DATA SUBMISSION

The principal budget data submission channel for all states participating in this study, and we suspect for all states, is the budget request document itself. In many instances this document is accompanied by machine-readable supplements of all data included in the budget document. Because of the short time span during which budgets are reviewed at the state level, it is desirable to expedite the process by including all relevant data in a single document.

In one state, Florida, budget submissions are supplemented by extensive data submitted on magnetic tape. This submission is related to use of a formula requiring data at relatively low levels of aggregation (instructional/department level) and the need to make large numbers of calculations in arriving at formula-based requests determined on a system or statewide average.

Channels other than the budget request document itself are used when formal submissions are relatively shallow in providing data, when issues arise in the budgetary process for which relevant data have not been provided, or when more timely data become available later in the course of review. Information sought on a non-routine basis is frequently gathered over the telephone, and separate submissions often are made once the process of review has begun at the state level and issues are raised which require more data. Hearings before the legislative committees or the governor, and more informal meetings, usually between staff, also provide an opportunity for the exchange of information.

These information-gathering processes directly related to review of budgets should be distinguished from more general collection of information for other state-level planning or review activities, or for external reporting purposes such as the Higher Education General Information Survey (HEGIS). Many state-level higher education agencies have a routine reporting schedule for the submission of various reports which are entirely separate from the budget process. Such reports may

include more detailed or more accurate historical enrollment figures; descriptions of facilities; certain student characteristics, such as counties of residence, to clarify enrollment patterns; and other historical information. Primarily because of timeliness, these reports have little bearing on the budget process. They may actually contain data that could have a bearing on the review process, but because of the importance of having all relevant budget data in one document, most budget submissions are virtually self-contained.

In several states, most often in connection with the activities of the executive budget office, an informal, but very important information "system" is the routine reporting of required information that must accompany budget administration or execution. Where they are used, various administrative forms used for such matters, among others, as personnel changes and requests for changes in allotments constitute a valuable information-gathering network for monitoring institutional operations. In one state this highly informal but effective system was referred to as "those little slips of paper which trickle into the budget office."

BUDGET REQUESTS

The physical form of institutional and system budget requests ranges from glossy documents with relatively superficial presentations of budgetary plans to extremely detailed documents running to over 600 pages of single-spaced narrative and tables. In essence, they all describe the fiscal need for state resources for the coming budget period, either a biennium or a year. Usually, the resources required for operating the entire institution or system of institutions are described and matched against estimates of revenues available from nonstate sources. The state is requested to provide funding for the balance.

In a few instances, where other budget materials and information are submitted, the formal budget document may be primarily a public document rather than an administrative form. This is the case in California and New York,

states in which, to varying degrees, the systemwide budget requests of the state university and college system, the university, and the state university do not contain the supporting detail on programs and expenditure items that most budget requests include. Budget requests may also be simplified where the use of budgetary formulas covering the major expenditure areas is well established. Such is the case in Mississippi, although institutions there also submit an object class budget request like that of all other state agencies which have been backed out of their formula request.

For each expenditure category (whether objects of expenditure, functions, or programs), data are usually included on expenditures of the most recently completed year for which totals are available, estimates of expenditures for the current budget year, and estimated expenditures for the forthcoming budget year or years under review. As discussed below, some states require budget estimates for five or six years beyond the current year. We emphasize again that a large amount of the data included in a budget request is not historical data, but estimated or projected. Because of the increasingly long lead times required for the budget process, budget requests submitted for a subsequent year, say budget year $t+1$, will certainly not include actual data for a year later than $t-1$, the past year, and possibly $t-2$, because accounts will not have been closed yet. Budgetary planning at the institutional level must usually begin far enough in advance that the appropriation process for the forthcoming year will not have been concluded.

The quantity of information in budget requests is related to the number of institutions or systems which submit requests to state-level agencies. Channeling requests through multicampus system administrations or through various coordinating or governing boards, so that the resulting requests are consolidated or aggregated, does reduce the amount of budgetary information handled by executive and legislative budget agencies. The type of institutions involved--whether undergraduate, undergraduate through master's degree, or doctoral-granting, and with or without independent departmental

medical or health science schools--also affects the complexity of the information flowing to the state level. There is, of course, no absolutely clear relationship between type of institution and amount of budgetary information submitted because some of the more complex doctoral-granting research institutions have constitutional autonomy, and this may reduce somewhat the amount of information they provde to state agencies.

For the 17 states included in this study, Table 2 shows the number of nonmedical four-year public campuses in each state, the number of campuses which submit budgets to be reviewed as part of a multicampus system, and the level of data aggregation at which review, information collection, and information use take place. Appendix C-1 shows a tabulation of the institutions that are excluded, that is, that are not necessarily reviewed according to the procedures described in this report. A table such as this can only grossly represent differences between the states, but it does serve to introduce some of the variations which exist in state practice.

Medical programs and the other institutions not included in the table are reviewed at the state level, but the review procedures discussed here and the commentary which follows do not generally apply to them. Obviously, the budgets for medical schools are one of the major items undergoing review at the state level, representing one of the most costly activities in the higher education budget. Also not thoroughly examined was state-level review of community college budgets. In a few states indicated in the table, budget review for community colleges, technical or vocational colleges, and university branch campuses is similar to the review of four-year institution budgets, or is included in the same process (see Appendix C-2 and Schmidtlein & Glenny, in preparation). Budget review for these colleges, therefore, depends on the same parameters as does budgeting for four-year institutions, and not on statutory formulas, which leave much less discretion to reviewing agencies.

Table 2 indicates that states with large numbers of institutions have some sort of consolidating or aggre-

Table 2

NUMBER OF FOUR-YEAR CAMPUSES WITHOUT MEDICAL PROGRAMS REVIEWED, BY INCLUSION IN MULTICAMPUS SYSTEMS, FOCUS OF REVIEW, AND LEVEL OF INFORMATION DETAIL PROVIDED

States and number of four-year institutions reviewed		Number of four-year campuses without medical programs included in multicampus systems which are aggregated (A) or consolidated (C)			Focus of SHEA review	Focus of executive and legislative review	Lowest level of detail received or used by executive office or legislative branch	
							Received	Used
California	28	University of California	(C)	8	Not app.	System	System and campus*	System
		California State University and colleges	(A)	20				
Colorado	12	None		0	Campus	Campus	Below campus	Below campus
Connecticut	5	University of Connecticut	(C)	1	System	System	System and campus*	System and campus*
		Connecticut State Colleges	(C)	4				
Florida	9	State University Systems of Florida	(C)	9	Campus	Statewide	Statewide	Statewide
Hawaii	2	University of Hawaii	(A)	2	Campus	Statewide	Campus	Campus
Illinois	12	University of Illinois	(A)	2	Campus	Statewide	Below campus	Campus
		Board of Governors	(A)	4				
		Board of Regents	(A)	4				
		Southern Illinois University	(A)	2				
Kansas	6	None		0	Campus	Campus	Campus	Campus
Michigan	15	None		0	Campus	Campus	Below campus	Campus
Mississippi	8	None		0	Campus	Statewide	Campus	Campus
Nebraska	7	University of Nebraska	(A)	3	Not app.	System	Below campus	Below campus
		Nebraska State College	(A)	4				
New York	22	State University of New York	(A)	22	Not app.	Campus	Below campus	Campus
		University of Pittsburg	(C)	2	System and campus*	System and campus*	System and campus*	System and campus*
Pennsylvania	23	Temple University	(C)	2				
		Pennsylvania State University	(C)	5				
Tennessee	10	None		0	Campus	Statewide	Campus	Campus
		University of Texas	(A)	6				
Texas	30	University of Houston	(C)	2	Not app.	Campus	Below campus	Statewide
		Texas A&M University	(A)	3				
Virginia	15	None		0	Campus	Campus	Campus	Campus
Washington	6	None		0	Campus	Campus	Below campus	Campus
Wisconsin	13	University of Wisconsin	(A)	13	Campus	Statewide	Below campus	Cluster

* In California, Connecticut, and Pennsylvania, state colleges are reviewed or provide information at the campus level, while the universities are reviewed or provide information at the system level.

gating process for combining institutional budget requests and thereby reducing the number of budget units which must be reviewed. In some instances, a coordinating agency or a statewide governing board reviews individual institutions at the state level, making possible a more aggregated review by executive or legislative agencies. As discussed more fully below, submission of requests consolidated at the system or statewide level does not entirely preclude review and analysis of institutional or subcampus data. A request consolidated at the system level may still contain individual campus details on pertinent budgetary issues.

The entries in the table for information collection and use are also subject to some qualification. The table indicates the aggregation level at which data is collected more or less comprehensively. Similarly, the column indicating use specifies the aggregation level for which data has some clear-cut use in the total range of budget-review activities. Use of information is difficult to determine when all that is known is that data are available. Use of data in a formula or a comparison is more easily determined. In the review of new programs, supporting data is necessarily at the subcampus level, even though the main body of the budget request is in terms of multicampus systems or institutions. Actually, therefore, in all states where new programs constitute a separate budget category, some data is reviewed at the subcampus level.

FORMATS OF INSTITUTIONAL AND SYSTEM REQUESTS

The types of budgetary information categories or formats used in budgeting were discussed in Chapter 2. To describe each individual institutional or system budget request requires more than a taxonomy of formats because these documents often use multiple formats and a variety of ad hoc representations of data. The formats of appropriation bills categorized in Glenny et al. (1975) do suggest formats that must be a part of the requests, but do not clearly indicate the breadth of information support that accompanies the original requests. Ordinarily,

just as the appropriation bill is only suggestive of the budgetary control that is possible, the budget bill gives very little indication as to the budget review methodology employed. The examples drawn from Connecticut, Hawaii, and Wisconsin in Chapter 4 illustrate the difficulty in labeling these according to a simple taxonomy. All three involve some use of the Program Classification Structure; yet all three also employ an object of expenditure classification. Format alone is hardly sufficient to describe the data requirements of a budget process.

INGREDIENTS OF BUDGET SUBMISSIONS

The informational content of budget requests varies along so many dimensions that it is difficult to generalize about them. Table 3 describes institutional or system budget submissions in the 17 states in terms of whether or not the submissions include several features which are significant in determining their information content:

- Submission of wage and salary detail for both academic and nonacademic positions disaggregated by individual positions.

- Submission of budgetary information on enrollment by level of student or course for explicit or implicit consideration in determining funding.

- Submission of budgetary information on the full range of instructional programs for explicit or implicit use in funding on the basis of differential costs.

- Submission of multiyear budget projections beyond the year for which funds are requested.

- Biennial budget submissions.

- Use of budgetary formulas to generate the major portion of the budget request.

- Submission of educational output measures.

Table 3

BUDGET DATA SUBMITTED TO EXECUTIVE AND LEGISLATIVE AGENCIES

States	Budget data							Data sources
	Wage & salary detail	Enrollment levels	Instructional programs	Multi-year projections	Biennial budget	Formula	Output measures	Institutional and system requests
California	Yes	Yes	No	No	No	No[1]	No	University of California Calif. State U. & Colleges
Colorado	No info.	Yes	Yes	No	No	No	No info.	No institutional requests examined in Colorado
Connecticut	Yes[2]	Yes	No	No	No	No	Yes[3]	University of Connecticut
Florida	Yes[4]	Yes	Yes	6 yrs.[5]	No	Yes	No	State U. System of Florida
Hawaii	No	No	No	4 yrs.	Yes	No	Yes[6]	University of Hawaii
Illinois	Yes[7]	Yes	No	5 yrs.	No	No	Yes[8]	University of Illinois Northern Illinois University
Kansas	Yes	No	No	No	No	No	No	University of Kansas
Michigan	Yes[9]	Yes	Yes	No	No	No	Yes[10]	University of Michigan
Mississippi	No	Yes	No[11]	No	No	Yes	No	Board of Trustees Request
Nebraska	Yes[12]	Yes	Yes[13]	1 yr.	No	No	Yes[14]	University of Nebraska Nebraska State College
New York	No	Yes	Yes	No	No	No	No	State U. of NY at Albany
Pennsylvania	No	Yes	No	4 yrs.	No	No	Yes	University of Pittsburgh Indiana U. of Pennsylvania University of Pennsylvania
Tennessee	No	Yes	Yes	No	No	Yes	No	Middle Tennessee State
Texas	No info.	Yes	Yes	No	Yes	Yes	No info.	No institutional requests examined in Texas
Virginia	Yes	Yes	No	No	Yes	Yes[15]	No	College of William and Mary
Washington	Yes[16]	Yes	Yes	No	Yes	No	Yes	University of Washington
Wisconsin	No	Yes	Yes	No	Yes[17]	No	Yes	University of Wisconsin

[1]The California State Universities and Colleges used a formula to generate faculty position requests for internal purposes, but state agencies did not use formulas. The University of California did not use a formula in determining instructional budgets.

[2]Wage and salary detail provided only by the University of Connecticut.

[3]Only student contact-hours.

[4]Wage and salary detail for current and new positions highly aggregated at the universitywide program level.

[5]Multiyear projections were abandoned in the FY 1975-76 budget cycle.

[6]See Exhibit 6 for a listing of the output measures used by the University of Hawaii.

[7]Wage and salary detail highly aggregated, showing only the number of positions by level by program. For FY 1974-75, the University of Illinois included a special study of nonacademic salaries, showing detail on positions and level, with its budget request. All institutions provided detail on faculty positions by level and tenure status.

[8]Earned degrees.

[9]Wage and salary detail is highly aggregated.

[10]Student credit-hours, student years completed, and earned degrees by level by program.

[11]In FY 1975-76, the Board of Trustees began use of budgetary formulas based on instructional program costs.

[12]University of Nebraska submitted wage and salary detail only for academic staff by level and school. Nebraska State Colleges submitted wage and salary detail only for administrative staff.

[13]Only the University of Nebraska included instructional program detail in its request.

[14]Enrollments and student credit-hours by level and school.

[15]Formulas in Virginia were used only as guidelines by state agencies.

[16]Wage and salary detail highly aggregated, showing positions by level aggregated by program.

[17]The biennial budget process included a formal process for annual review.

To summarize just how informative these documents are, we would have liked to identify the "key" dimensions of budget submissions. It has been impossible to do that satisfactorily; some dimensions clearly transmit more information than others. However, the impression given about information content from observing the number of columns shown in Table 3 is not entirely inaccurate. The University of Washington budget request was undoubtedly one of the most extensive we examined, and the budget requests of the California State University and Colleges System and the Mississippi Board of Trustees were undoubtedly the least extensive. In all cases, the intent of the chart is to treat those requests which receive primary attention by legislative or executive agencies. As we shall note later, legislative agencies sometimes focus their review on the governor's budget rather than on the institutional or system requests.

FORMULAS

The use of formulas according to the strict definition given in Chapter 4 makes the use of budgetary information in relation to budgetary outcomes fairly explicit. Their use at the state level, the only use we are considering, provides a structure for the information in budget requests and generally makes that information more intelligible. Note that formulas may be used for reallocation within higher education systems, as in the California State University and Colleges System, but not in developing budget requests. Formulas are likely to reduce the information load in budget submissions because their use obviates a need and an interest for the more sophisticated types of educational program and output measures. The use of formulas usually goes hand-in-hand with a funding methodology which takes into account differences in instructional and support costs associated with course or student level and the discipline of the instructional program. Because formulas provide a direct link between data and budgetary outcomes when used in the strict sense, their use in this manner always represents considerable staff work and negotiation before their application. This development or measure-

ment process provides a vehicle for exchanging information of all kinds which then can be left out of the formal budget process. "Formula" use without these pre-agreements requires information exchange and adjustment after the fact.

Although the use of formulas involves a great deal of information on higher education activities in terms of apparent scope and substance, it should be kept in mind that much of the data involved is fictitious with respect to actual institutional operations, or is at such a level of aggregation that it indicates very little about institutional practice. All the budgetary formulas encountered in this study employed budgetary parameters which were statewide averages. This being the case, a formula budget indicates only a *planned* level of enrollment or student credit-hour production for the institution or system in question, and not institution-specific data on actual incurred costs, student-faculty ratios, or other workload parameters. The Texas formula is an exception in that enrollment levels are actual; its cost factors, however, are statewide averages.

Formulas rarely generate the entire operating budget and the formula-generated amounts rarely survive the entire review process uncut. Therefore, even formula budgets require additional support information, which sometimes may call for considerable detail.

DATA TO SUPPORT COST DIFFERENTIALS FOR LEVEL OF STUDENT OR COURSE AND INSTRUCTIONAL DISCIPLINE

Where formulas are not used in a strict sense, the explicit use of data disaggregated by level and instructional program is less obvious. When provided, these data tend to appear in the budget submission as something of an appendage, and frequently are part of a justification for workload increases (and higher planned expenditures) brought on by enrollment shifts to more expensive instructional programs. In states where budgetary review is more judgmental or discretionary,

this kind of data may be subcampus data pertaining to a particular institution rather than to a statewide average of the kind used in formulas.

The present study discovered no workload measures or parameters that would not be familiar to practitioners. However, some of the distinguishing features of these budget parameters should be noted. Enrollment data, for example, is quite widely reported in budget documents and is widely reported to be the prime element "driving" budgetary outcomes. In most instances, the enrollment figures reported are not determined by actual enrollment counts, but rather by dividing the number of student credit-hours earned at various course levels and programs by a standard student credit-hour load, usually 15. In rare instances, periodic surveys may be made to determine a more accurate credit-hour load factor. Thus, because enrollments are really secondary data and student credit-units primary, the use of student credit-units as a budgetary datum is much more common. It was found to be the principal workload measure (either as a unit cost or a productivity index) in 12 of the 17 states. Seven states employed student-faculty ratios. Many states, of course, calculated more than one such measure.

Actual enrollment data is the basis for generating budgets under the formula structure employed in Texas. Audited historical enrollments as of the 12th class day of the fall quarter is the only workload element for which the legislature will appropriate funds for instructional activities. Because Texas has a biennial budget, there is a critical necessity to update the enrollments used in the formula in order to base appropriations on the most recent enrollment level possible. The updating of these enrollments is the responsibility of the Texas Coordinating Board.

As students increasingly take courses at higher levels than their student status, the distinction made between workloads by course or student level has become an important one for budgetary purposes. Most states that make this distinction use course level to determine workloads. The number of levels to be distinguished also has grown.

Four levels--lower division, upper division, graduate (master's), and graduate (doctoral)--now seem to be required in order to adequately reflect differences in resource use among programs. Some states are now considering using the method of instruction (lecture, laboratory, or tutorial) as a factor reflecting resource requirements. Ultimately, essentially the same procedures are used by states wishing to take into account levels by course, student, or variations in instructional programs, there being only three or four different parameters involved.

The desire, primarily held by legislatures, for simple indices that encompass the whole range of activities, is reflected in Connecticut's use of the SCHLDE (Student Credit Hour Lower Division Equivalent), an output measure relating student credit units earned at various course levels to student credit units at the lower division level. The number of SCHLDEs per FTE faculty computed for various institutions or departments provides a single index measure of workload or faculty output.

UNIT COSTS

In spite of the attention given to unit costs in discussions of budgeting, management, and planning for higher education, the actual use of unit costs in state budget analysis in any exacting sense is relatively infrequent. A unit cost can be calculated quite simply with budgetary data by dividing any of the many expenditure figures available by some workload (production) measure; for example, enrollment or student credit-hour production. For the unit cost calculated in this fashion to have any usable budgetary implications, it must be determined for some cluster of organizational activities which can be distinguished either in terms of activity inputs or outputs.

Unless one is concerned only with direct costs, any organization has trouble accounting for its use of inputs in a production process if it does not have a well de-

veloped cost accounting and recharge system. Such systems are often lacking in higher education because the ill-defined nature of educational outputs makes it a particularly difficult task to compute costs with respect to outputs. Thus, only two of the 17 states, Florida and Tennessee, make explicit use of unit costs (direct costs attributable to the production of student credit-hours) in their budget processes. Several other states perform routine unit cost studies, but do not make explicit use of them in the budget process. A larger number of states require that unit costs of one sort or another be reported, but make limited use of them in budget analysis. The inclination to use this kind of data does seem to be increasing in state agencies, however, and we can expect interest will continue in developing institutional and system information systems to provide accurate data of this kind.

Unit cost data in all instances we observed were average unit costs and, therefore, made no distinction between fixed and variable costs. These data are based on the explicit or implicit assumption that unit costs are invariant with the scale of operations, that is, that costs increase or decrease in direct proportion to increases or decreases in enrollment, student credit-hour production, or other measures of educational activity. Cost data which is a direct input to a budget formula (as in Tennessee, for example) are measures of the direct use of nonrestricted funds for instruction. The computation of estimated total instructional budgetary requirements follows directly from projections of student credit-hour production. Nonstate revenues are subtracted from total budgetary requirements to arrive at the level of funding requested from state sources.

In Tennessee, direct costs of instruction were determined biennially for 30 disciplines at five different instructional levels. Similar cost data for five different disciplines and four course levels were used in Wisconsin to adjust funding for instruction for marginal changes in enrollment. Florida generated and used unit cost data very much like Tennessee, but has developed common accounting categories and procedures and a computer-

based system to a fuller extent. The Texas formula is one of the oldest, even though it undergoes continual revision and expansion to cover more functional areas. Strictly speaking, it is not a cost-based formula, but rather one that relies on average faculty salary and student-faculty ratio parameters in the instructional area.

It should be made clear that the unit cost data in use in the states is highly aggregated and more accurately depicts relative cost patterns in general than relative costs between specific organizational units. It is therefore of very little value as an analytic device for identifying efficient or inefficient educational practice or properly costing out educational activities in an accounting sense. Its use is highly pragmatic insofar as it is an acceptable methodology to all budget process participants for estimating future expenditures in the instructional area.

In other states, the development of unit cost data, even when it has become routine, takes on the appearance of a special analytic study rather than that of part of a budget process. In California and Washington, the coordinating agencies have performed this function for some years, the staff of a council of university presidents conducted a cost study in Michigan; and in Hawaii, an analytic study of instructional unit costs was conducted in 1973 by the University of Hawaii's central administration staff.

These cost studies tend to be somewhat more rigorously conceived than cost studies which feed directly into a budget process. They also are more likely to attempt to allocate and determine total costs (both direct and indirect) by making assumptions that might not be acceptable in a process used to develop budget estimates. To estimate such total costs, it is necessary to make assumptions about the allocation of support costs to instruction and about the allocation of instructional effort and resource use for various levels of instruction. The more accurately such cost studies portray institutional operation, the greater is the temptation for central budgetmakers to try to control

operations. However, because most of these cost allocation rules may not in fact be consistent with actual lines of organizational responsibility and authority, they are therefore unsuitable for establishing the accountability of responsible administrators other than those at the highest organizational levels.

WAGE AND SALARY DETAIL

Higher education operating budgets, like most of the budgets reviewed for public sector activities, are devoted predominately to expenditures for labor inputs, referred to as personal services in object of expenditure terms. Therefore, a significant portion of the data provided with budget requests may be related to what is virtually a line-item budget for every budgeted position in the organization requesting funds. The budget submission may include individual positions and position numbers, lacking only the name of the persons holding the positions. Provision of this kind of information, especially if state government maintains control of positions, is an indication of classic line-item review. Where position control does not exist, and where wage and salary detail is shown only for large aggregates, the significance of added increments of information is appreciably reduced. Even in those cases (clearly the majority) where the institution or system is not bound to the description and complement of positions in the request, a clearer depiction of institutional operations emerges from this description of the personnel complement than from budget requests comprised of expenditure estimates based on formulas or programmatic considerations.

OUTPUT MEASURES

Even though formal program budgeting has not been successfully implemented in its entirety in any state budget process, various fragments of the methodology have been adopted, and the associated information reporting requirements have been incorporated. This is especially so with respect to information on educational

outputs. Many of the output measures that have been devised are not very sophisticated and merely represent previously reported data under new names. Data on enrollments, student credit-hour production, and degrees awarded fall into this category of data that are justifiably quantitative, yet suspect as true measures of educational production. Such data have been collected for some time as a part of HEGIS (Higher Education General Information Survey), and they constitute no real additional reporting burden, except that reporting of information to be used in the budget process must be more timely. Student contact hours, defined as the clock hours per week actually spent in scheduled teaching, thesis supervision, and meeting with students in connection with course content, have been adopted in a few states as a new measure, although it is an only slightly modified version of an old instructional output measure, the student credit hour. Collection of student contact hour data requires additional information reporting systems and procedures.

Hawaii, Pennsylvania, Washington, and Wisconsin have attempted much more sophisticated approaches to measuring educational outputs in conjunction with budgeting. The output measures for Hawaii and Wisconsin were described in Chapter 4. Output measures required in Pennsylvania are listed in Exhibit 9. As was the case in the Hawaii information requirements, great variation existed among the Pennsylvania institutions in their ability to provide these measures for FY 1974-1975. The budget request of the University of Washington for the same year contained the most sophisticated discussion of education performance and output measures that we observed in any of the 17 states. In this Washington request, measures of extensiveness, efficiency, effectiveness, and program benefits were included along with a narrative discussion of a quality that might well have qualified it for acceptance in a scholarly professional journal. Whether this presentation was effective with the legislature is another matter, and one we could not determine. It is noteworthy, in our estimation, that this kind of detail and this level of discussion is considered necessary to justify public expenditures.

Exhibit 9

PROGRAM MEASURES REQUIRED IN PENNSYLVANIA BUDGET SUBMISSIONS, FISCAL YEAR 1974-1975

Full-time equivalent students
Number of associate degrees conferred
Number of bachelor degrees conferred
Number of masters degrees conferred
Number of first professional degrees
Number of doctoral degrees conferred
Number of degree recipients working in their major field one year after graduation
Number of medical school graduates interning in Pennsylvania
Number of education graduates not seeking certification from the Department of Education
Number of registrations in adult/continuing education activities for degree credit
Number of registrations in adult/continuing education activities for noncredit
Number of registrations in adult/continuing education activities for conferences, institutes, and workshops
Number of students receiving financial assistance
Number of research projects currently supported by state funds
Number of graduate students supported by state funds
Number of full-time professional staff supported by state funds
Number of new projects initiated with state funds
Negotiated overhead rate on federal contracts and grants
Percent of state funds devoted to institutional support

Source: Commonwealth of Pennsylvania, Budget Instructions for Colleges and Universities, FY 1974-1975, Appendix B.

BIENNIAL BUDGETS AND MULTIPLE-YEAR PROJECTIONS

Five of the 17 states studied prepared biennial budgets. At least one of these, Wisconsin, had a formal annual review process after one year, involving formal document submission for updating or revising budgetary requirements for the second year of the biennium. The bulk of data required for a biennial process is approximately twice as great as for an annual process, but there probably is considerably less work involved in producing the information load. There are clearly returns to scale in data collection and submission. A biennial process with annual review requires not only biennial submission of data, but in addition, only a slightly smaller data submission for the second year. Although the information workload will not be significantly greater than for two annual submissions and will probably be less, if the opportunities for incorporating some mid-range planning decisions in the budget process are taken advantage of, there will, of course, be a considerable increase in the analyses required. Checking and costing difficulties are probably not increased two-fold, but evaluation and bargaining issues are undoubtedly multiplied within the longer budget time frame.

A biennial process does introduce desirable planning considerations into budget preparation, precisely because of its longer time frame, which may not be present in an annual process. Budgetary estimates for the second year will be considerably more uncertain, however, and this fact will undermine their eventual accuracy. As a budgeting practice, biennial budgeting raises many other considerations than information load--principally, the uncertainty of expenditure plans in a time of transition and price inflation (see Schmidtlein & Glenny, in preparation, for a discussion of these considerations).

The submission of multiyear projections beyond the budget period in question is a device associated with PPB, which was employed for higher education in five of the 17 states for FY 1974-1975. That year was the first in which the procedure was used in Illinois, and the

last in Florida. Typically, although multiyear projections add considerable bulk to budget requests and appreciably increase the number of figures that must be estimated, neither the providers of the projections nor reviewers give them much credence. In the main, the projections are arrived at by extrapolation or guesswork. The University of Nebraska, for example, provided its additional year of budget estimates by merely duplicating the figure for the preceding year. In general, no budget participant wants to be committed to figures arrived at in this way, and thus any serious effort by institutions or state agencies to determine the direction or magnitude of trends in expenditures is not likely to be forthcoming because of the fear of locking these expectations into the budget process prematurely.

OTHER DIMENSIONS OF BUDGET DOCUMENT CONTENT

The seven characteristic information items included in budgets, described above, cannot adequately describe the full spectrum of data found in budget submissions because so much of this information relates to idiosyncratic features of each state's review procedures or its higher education governance structure. One such feature, which we have been unable to treat in any systematic way, is the submission of information on nonstate revenue sources. As noted earlier, most states request the balance between their expected nonstate revenues and their expected total expenditures from the state. To support estimates of this balance, institutions must estimate the magnitude of nonstate support. A few states require that revenue source and expenditure data be provided by program. Hawaii provides a good example of a process in which institutions provide revenue source data by expenditure program for the prior year, the current year (estimated), and the budget period.

The principal issue involved in submission of data on nonstate sources of revenue is not entirely provision of information, however. If the institutions retain control over nonstate funds, provision of these estimates, which are frequently underestimations, will do little

toward promoting state control, although it may invite it. Some institutions have balked at providing this information to state agencies on grounds of constitutional autonomy, for reporting information may be only a prelude to its use. On the other hand, there does appear to have been a trend, at least in the states involved in this study, to reduce the operating flexibility that institutions derive from their multiple sources of funding--legislative appropriation of more and more of their total funds, and executive budget office allotment procedures which offset surpluses in nonstate funds or otherwise recoup unexpended balances. A substantial amount of information on nonstate revenue sources is contained in most budget submissions, but its quality and usefulness to budget examiners are difficult to evaluate except in the context of a particular budget process.

Budget submissions also contain varying amounts of narrative, ranging from virtually none at all to extended discussions of institutional or system role and scope, supporting arguments for specific items in the request, and assorted budgetary issues such as performance evaluation and educational effectiveness. In many instances, these narratives are essentially freeform, adjusting content and format to the subject at hand; elsewhere, they conform to elements prescribed in budget instructions, and cover program objectives, target groups, and measures. Narratives also may attempt to explain special features of the context in which the request is being made by referring to trends or patterns that the quantitative portions of the submission do not show.

A subjective feature of budget submissions which is probably very important for its effect on elected and top administrative officials, who are not likely to be much concerned with detail, is how much one could learn about a particular institution from its budget request. A budget examiner's concern with determining just what an institution really needs and what is additional padding will eventually lead him to develop certain sensitivities that help him review budgets. His focus will more likely be on the most objective elements of the request. But others who have a say about what funds an institution

gets will want to have information that explains how the alma mater is organized, what its real tasks are, and how the athletic program is doing. Many will get this information from personal contacts with institutional officials, communications from concerned individuals, and the media. We did not explore these alternative avenues of transmitting information outside the formal process. They are without doubt as important as the request document itself, certainly even more important for some process participants. Yet in considering the institution's formal submissions alone, one is struck by the differences, from state to state, in the effort that is put into making the budget request a persuasive argument for support of higher education programs.

Schick (1971) has commented that a considerable amount of the narrative material he observed in state budget documents was added to bolster agency budget claims and to supplement public information appearing in statistical tables. In few instances, he said, were the narratives helpful to budget process "insiders," nor did they deal directly or rigorously with questions of agency performance. Our impressions were largely the same, except that we often found the bulk of these narratives appreciably greater than Schick suggested when he described narratives as citing the agency's legal status or discussing somewhat what the agency is doing.

Many states are calling for elaborate narrative descriptions of role and scope, mission and performance, but it apparently takes from two to three budget cycles for the institutions to fully realize the opportunities in these narratives for "selling" themselves. Under formal PPB, these narratives were envisioned as a distillation of issues and implications that had been explored in special studies and program memoranda carried out considerably in advance of the submission of budgets. Plans for carrying out these preplanning activities and linking them with the budget process do not seem to have materialized. As a consequence, calling for the inclusion of these "items" in the budget documents results in staff and others substituting such knowledge as they have and relying on a sense of what will help "sell" a budget.

THE DOCUMENTS OF STATE BUDGET AGENCIES

In his study of the federal budget process, Wildavsky (1964) has suggested one perspective from which to view the budgetary process.

> Throughout this volume we shall be concerned with budgets as political things. Taken as a whole the federal budget is a representation in monetary terms of governmental activity. If politics is regarded in part as conflict over whose preferences shall prevail in the determination of national policy, then the budget records the outcomes of this struggle. If one asks, "Who gets what the government has to give?" then the answers for a moment in time are recorded in the budget. (p. 4)

If we take this literally, then each request, recommendation, or alternative is a proposal for budgetary outcomes and a tentative answer to the question, "Who gets what the government has to give?" The appropriation bill is the final score. But there is an alternative perspective, which really is the impetus to many of the informational and analytical reforms suggested for state budgeting. This alternative view is that budgeting is much more than determining who (in the narrow sense of which specific agencies, government employees, consultants, and contractors) gets what (namely, an authorization to encumber public accounts); budgeting is, to name a few examples, a program or a plan for reducing poverty, hunger, or disease, or for implanting technological and professional skills. A budget in this sense is a plan for doing something. As should be clear from the previous discussion of institutional and system requests, these documents now are much more specific about who will get what than they are about concrete plans for action, although information reforms have forced some attention to the latter.

Institutional and system requests provide information on institutional operations, contextual influences, and other supporting data. Subsequent review by state

agencies generates further information on priorities, constraints on revenue, and political expectations. State-level agencies communicate in many ways besides the exchange of formal documents, but this exchange is in many instances the principal means through which staff analysts obtain technical information. Table 4 shows the formal budget documents prepared by the various types of agencies in the 17 states studied. These do not include staff issue or policy papers intermediate to a final recommendation or appropriation. Of course, budget processes in all states conclude with the passage of an appropriation act which is the definitive formal budget document.

All of these documents are public information in the broad sense, but there are considerable differences among them: Some are merely administrative forms tabulating a comprehensive set of expenditures with no supporting argument; others describe the substance of agency programs and give some sense of alternatives being considered and choices being made. In the introduction of the first of The Brookings Institution's series of yearly volumes on setting national priorities in budgetmaking, Schultze (1970) wrote that the executive budget presented to Congress is designed to persuade, not to inform. This describes many state budget documents as well. Although as "outsiders" we lacked sufficient time, insight, and information to judge the adequacy of these documents, many state staff personnel indicated that their review also was hindered by a lack of information.

With very few exceptions, higher education budgets are actually reviewed thoroughly by only one state agency or in depth jointly by two agencies. The task falls to the other agency staff or staffs to check the results both technically and for policy implications by testing and probing under severe constraints of time, expertise, and information. The "norm" of state agency interaction, therefore, is for institutions to submit requests to a coordinating agency (or a statewide governing board) where they are examined for internal consistencies, adherence to program approval procedures, and general congruence with a state plan. Coordinating agency recommendations, along with institutional requests, then go to the execu-

Table 4

STATE AGENCIES THAT PREPARE FORMAL BUDGET DOCUMENTS

States	Statewide governing board	Coordinating agency	Executive budget office	Legislative budget staff
California	Na[1]	No	Yes	Yes, Legislative Analyst's analysis of the budget bill contains recommendations
Colorado	Na	Yes	Yes	No
Connecticut	Na	Yes	Yes	No
Florida	Yes	No	Yes	No
Hawaii	Yes	No	Yes	No
Illinois	Na	Yes	Yes	No
Kansas	No	Na	Yes	(Yes), no staff for FY 1974-75. Legislative research department has since prepared staff reports, but not recommendations.
Michigan	Na	No	Yes	Yes, House & Senate fiscal agencies jointly prepare summary of net state appropriations.
Mississippi	Yes	Na	No	Yes, Commission of Budgeting & Accounting recommends in annual budget report.
Nebraska	Na	No	Yes	Yes
New York	Na	No	Yes	No
Pennsylvania	Na	Yes[2]	Yes	No
Tennessee	Na	Yes	Yes	No
Texas	Na	No	Yes	Yes, Legislative budget board's budget estimates contain recommendations.
Virginia	Na	No	Yes	No
Washington	Na	No	Yes	No
Wisconsin	Yes	Na	Yes	Yes

[1]Na = Not applicable

[2]Department of Education makes recommendations to the governor through an internal memorandum.

tive budget office where they are reviewed in technical detail and adjusted to meet the priorities of the governor's program. As a part of the governor's budget, executive recommendations are checked by the legislature, modified to meet legislative program priorities, and passed in an appropriation bill which the governor eventually signs. If the budgetary role of multicampus systems in California and New York is considered equivalent to this one, nine of the 17 states displayed such a pattern of interagency relationships (California, Connecticut, Florida, Hawaii, Nebraska, New York, Virginia, Washington, and Wisconsin). By allowing only for a shift in technical budget review from the executive budget office to the coordinating agency, three more states can be regarded as exhibiting this budgetary pattern (Illinois, Kansas, and Tennessee) for a total of 12 out of 17. The remaining states, Colorado, Michigan, Mississippi, Pennsylvania, and Texas, all differ from the 12 in some respect, principally in an expanded legislative role as a coequal of the executive in constructing a comprehensive state budget. (For a discussion of the implications of the latter arrangements, and a more complete discussion of the "norm," see Schmidtlein and Glenny, in preparation.)

It would be presumptuous to recommend the "norm" as a process that all states ought to adopt, but this process does illustrate one way in which the budget review roles of various interests can be coordinated. What amounts in essence to joint executive-legislative budget development and review in Texas and Mississippi appears also to be a stable pattern of shared responsibility. Information needs are obviously not the sole source of conflict, but they can become the focal point of tension and interagency disagreement because information requirements are greater for an agency which develops its own recommendations than for an agency which simply modifies those of another agency.

When there is fundamental disagreement over the premises on which review is conducted, all agencies may then find it necessary to develop their own information bases and ignore the technical review of other agencies. The

review process can evolve far beyond a state of beneficial redundancy to a state of "mass confusion." Such fundamental disagreement was evidenced most strongly in Michigan and Pennsylvania, two states in which program budget reforms have been initiated by the executive. In Pennsylvania, we found little evidence of a technical or analytic review by legislative staff, and therefore the information needs of the legislature were met satisfactorily with crosswalks from a program classification to an organizational structure. In Michigan, however, duplicative information requests were made of the institutions to support a detailed review by the Department of Management and Budget in terms of program categories and a similarly detailed review by the legislative fiscal staffs in terms of organizational units. The gravity of the conflicting review procedures in Michigan is indicated by excerpts from a September 18, 1974 memorandum by the state budget director to legislative leaders:

> It would be useful to iterate more precisely the legal framework for the budget process and the specific disruptions which have been caused by legislative demands upon the agencies for information. . . .
>
> Taken in the aggregate, the statutes establish in rather clear terms the budget system as a whole--not an *executive* budget system but the entire system. All powers, duties, and functions related to planning and preparation of the proposed budget are vested in the State Budget Director. This includes all information he requires, as well as that deemed wise and of material value to the Legislature in its consideration of the financial needs of the state. This broad, comprehensive authority is backed up by subpoena power. By being so clear, it precludes legislative initiatives which interfere or contradict or complement the system. In short, there is no specific, stated legal basis for a legislative budget system. In fact, there can be only one

state budget system, according to statute, and that is determined by the State Budget Director, an appointee of the Governor.

Requests for information to prepare budget positions which are not consistent with either those established by the State Budget Director as required to prepare and present the budget or contrary to established reporting systems on fiscal management result in a time disruption that deters agencies from meeting executive timetables.

In short, the spontaneous requests for information which periodically emerge from the fiscal agencies confuse the authority vested in the State Budget Director by the Constitution and state statutes.

Other manifestations of a less serious lack of coordination in the use of budget information were present in Colorado, where the Commission on Higher Education made budget recommendations in terms of student-faculty ratios which included both filled and unfilled faculty positions, whereas the staff of the Joint Legislative Budget Committee wanted to make its recommendations on the basis of information about more specific operating conditions. In Connecticut, differences in required information bases between the Department of Finance and Control, which reviewed budgets in terms of detailed objects of expenditure, and the Commission for Higher Education, which reviewed budgets in terms of aggregated functions and programs, were met by a dual institutional budget submission.

The remainder of this chapter is devoted to a survey of the documents of state higher education agencies, executive budget offices, and legislative budget staffs. The contents of the documents will be discussed with respect to the amount and kinds of analysis and supporting arguments found in them. The approaches to review

taken by the various agencies are described more completely in Glenny et al. (1975). In this report we are trying to give the flavor of these documents as information sources and as indicators of the substance and style of review. In some instances it is necessary to qualify the impression of comprehensive rationality given by the documents because budgetary totals must usually be reached through recourse to political bargaining and attention to revenue limitations. Subaggregates and details may then be "backed out" after the fact. Although it may be that these "rationalizations" have little direct impact on the substance of budgetary outcomes, the fact that they are recorded at all, even as "reconstructed logic," suggests some appeal for support on the basis of reason and analysis. These documents both provide an agenda for discussion in subsequent review, to some degree, and also focus reviews on a smaller and a more manageable number of issues.

COORDINATING AGENCY RECOMMENDATIONS

State higher education agencies, other than statewide governing board staffs which have statutory budget authority to make recommendations to the executive branch or the legislature, usually do so in a formal document. Consolidated governing boards frequently develop rather than review the higher education budget request submitted to executive and legislative budget agencies, and a discussion of these formal requests was included in the first part of this chapter. The Kansas Board of Regents and Mississippi Board of Trustees are exceptions to this role of consolidated governing boards among the five consolidated governing board states included in the 17-state sample. The Kansas Board of Regents' staff thoroughly reviews campus requests to the governor and legislature, but the results of this review are reflected in revised institutional requests to the legislature and not in documents of the Regents' staff. The revised campus budgets subsequently are published by the Regents in a single document which becomes the Regents' Budget Request. The Mississippi Board of Trustees' staff checks institutional requests submitted in object of expenditure format, but prepares the formula-based request.

In this section we shall describe the formal recommendations made by five coordinating agencies, in Colorado, Connecticut, Illinois, Pennsylvania, and Tennessee. Statewide governing board submissions were included in the first section of this chapter, which dealt with institutional and system requests. It should not be inferred that these formal recommendations constitute the only way in which a state higher education agency can influence the budget process.

Coordinating agency recommendations, in general, condense institutional requests to one summary volume, but they do not necessarily supplant the institutional requests which are also available for subsequent state agency review. The recommendations eliminate considerable detail and tend to use formats not heavily influenced either by PPB procedures or hidebound object of expenditure details. With the exception of Illinois, where the Resource Allocation and Management Program (RAMP) procedures were being implemented, coordinating agencies were not emphasizing a programmatic format, nor was there extensive use of narrative or clarifying argument. The Program Classification Structure was used in some recommendations, but the principal focus was on functional categories of expenditure. Coordinating agency recommendations were aggregated at the same level as organizational requests were reviewed in all states but Connecticut; there the recommendation on the state colleges was consolidated, although individual campus requests were reviewed. In Colorado, requests for certain support functions (e.g., student financial aid and automated data processing) were consolidated and an appropriation made to the Commission on Higher Education for allocation among the institutions.

The responsibility to formally recommend requires that the coordinating agency recommendation be comprehensive and sensitive to political realities. Consequently, these formal recommendations do not reflect the substantial amount of analysis that often goes into them. They are, by and large, influential for the "answers" they give, not for the supporting justification and argument they provide. In Tennessee especially, but also in Illinois, these recommendations are derived

from the most thorough analytical review conducted by any budget agency in the state. Historically, the recommendations of these agencies have been quite influential. In general, lack of analytical substance may not necessarily detract from recommendations in the view of executive and legislative budget agencies, but without such analysis, there is no factual leavening for the political process and little help in making the recommendations credible. Only one of these formal recommendations was cast explicitly in the context of longstanding policy and planning considerations. As we have indicated, these formal recommendations are frequently important in framing the agenda for subsequent review; none of them, however, were structured to focus this review on sharply defined or specific issues.

FIVE COORDINATING AGENCIES

In the five cases where the coordinating agency makes a formal recommendation, the agency either plays the dominant role in specifying the format and information support to be included in institutional or system budget requests, or it serves as a conduit in expressing the information needs of other state fiscal agencies. (The process is only just beginning in Pennsylvania, but it seems likely to reach fruition for the state-owned institutions.) Each of the five coordinating agencies to be discussed had designed a review methodology of varying degrees of sophistication and complexity together with the supporting information requirements. In Colorado, this was exemplified by the workload and productivity data desired by the staff of the Joint Budget Committee; in Connecticut, data was provided by program and by object class according to "A," "B," and "C" priorities; in Illinois, the Resource Allocation and Management Program (RAMP) procedures, which are a PPB style information format, dictated the form of requests; in Pennsylvania, calculation of the Department of Education's formula factors were required; and in Tennessee the instructional unit cost formula structured the request.

Review by these coordinating agencies, and subsequent review by executive and legislative budget staffs was not

limited to these devices or techniques, except in the case of the Tennessee formula, but subsequent review was influenced, or at least structured, by their presence. Only in Pennsylvania, where the use of technical budget procedures at the state level were relatively new, is it likely that these devices had a very limited impact, and this only with reference to the state-related and state-aided institutions. The review process for the state-owned institutions was structured by the Department of Education's workload indicators. Until recently, regionalism and partisanship in the legislature virtually swamped any analytical review of higher education budgets.

The short summaries which follow describe the formal recommendations of these coordinating agencies. Pennsylvania is omitted because the recommendation process was not fully established at the time of our site visits, and consequently we had no recommendation document to examine.

Colorado. The formal recommendations of the Colorado Commission on Higher Education showed actual, estimated, requested, and recommended budget-year expenditures for all campuses by functional classifications. The narrative contained general supporting analysis and justification, with little explicit justification for item-by-item recommendations among campuses. For example, in the instructional area the basis for recommendations was summarized as follows in the 1974-1975 *Operating Budget Recommendations* of the Colorado Commission on Higher Education:

> For 1974-75, recommendations for numbers of faculty and related academic administrative staff were determined from a combination of (1) the institutions' requests including budget narrative and budget hearing presentations; (2) consideration of the institutions' role, mission, and program within the Colorado postsecondary education system; (3) analysis of student/faculty ratios based upon guidelines for each of the three groups of institutions described above (large, small, medium-sized); and (4) calculation

> of need based upon actual historical student/faculty ratios, particularly that for 1973-74, related to full-time equivalent students expected in 1974-75. (pp. 32-33)

Connecticut. The Commission on Higher Education (CHE) makes budgetary recommendations for the constituent units (regional community colleges, state technical colleges, state colleges, University of Connecticut, and the University Health Center) of the state's postsecondary educational institutions. Formally, the recommendations of the commission are supposed to be reviewed as the constituent units request. In fact, however, they were not, because the informational detail of the CHE recommendations did not meet the needs of the budget review approach of the Department of Finance and Control. Nonetheless, CHE recommendations did provide a rationale for budgetary requirement estimates at a fairly aggregated level. In addition, they provided a priority indication for funds requested above the level of expenditures for the previous year. For the state colleges, they included a recommendation on the allocation among institutions of the budgetary augmentation recommended by the commission. The CHE recommendations contained a moderate amount of narrative explanation and justification.

Illinois. The Board of Higher Education, through the Director's Report on the Operating Budgets for institutions and activities, makes annual budgetary recommendations to the Governor and the General Assembly. These recommendations combined the level of disaggregation found in the Colorado commission's recommendations with a slightly more extensive level of narrative and explanation than appeared in the Connecticut commission's recommendations. The Board of Higher Education's recommendations were completely rationalized within the Director's Report: One can start with the prior year's base, follow the recommended adjustments, add on salary and price increases at common rates, and determine deficiency adjustments and new program and/or enrollment support. All items were summarized, but at the campus level one has a picture of expected expenditures in terms of a total base and adjustments to that base. It

is noteworthy that very little of the RAMP documentation was used in the Director's Report in 1974, and that functional or programmatic categories were eschewed in the recommendations. Issues in the sense of new academic programs and price and salary increases were discussed rather broadly, but there was no discussion of other expenditure categories, even in the increment over the prior year's base.

Tennessee. The Higher Education Commission (THEC) submits an aggregated budget request based on the institutional requests to the Division of the Budget. Because most of the request was generated using formulas determined from the biennial cost study administered by THEC, little analysis and justification was required with their formal recommendation.

GOVERNORS' BUDGETS AND EXECUTIVE-LEGISLATIVE INFORMATION-SHARING

The governor's budget is the formal communication of a comprehensive state expenditure plan by the governor to the legislature. Many observers have suggested that analytical budget reforms and accompanying procedural change (what Howard, 1973, appropriately called "rationalistic budgeting") offer an opportunity for the governor to take greater initiative in policy leadership. One might expect, therefore, that executive documents would more commonly reflect this approach, and highlight the substance of programs rather than operational detail.

There are two ways in which governors and executive budget offices have tried to increase policy leadership through involvement in earlier stages of the budget process. The first is exemplified in Michigan and Pennsylvania by the governor's issuance of Program Policy Guidelines prior to budget submission. These guidelines identify the governor's policy and program priorities and are intended to provide a vehicle for coordinating executive and agency planning in the final stages of budget preparation. In practice, they do not go far toward achieving that end because of their broad non-

specific nature. The second way, found in virtually all other states, is through the specification of new information categories and budget structures which were discussed in the first section of this chapter. These changes are much more pervasive, but as we shall discuss in Chapter 6, the focus of review has not yet shifted substantially.

The executive budgets themselves, with exceptions noted below, are generally much less informative than coordinating agency recommendations, both in their description of institutional activities and programs and in their narrative justification. Further, they condense expenditure estimate detail, at the same time maintaining the consolidated or aggregated distinctions present in the requests or recommendations they receive. Though it is true that the state budget is the most important policy document in state government (Dye, 1973), and therefore that the governor's budget is the most important statement of executive policy intentions, most gubernatorial budgets state policy only implicitly, and give very little indication that they are anything but, in Wildavsky's words (1964, p. v), "the province of stodgy clerks and dull statisticians."

In Connecticut, Michigan, and Pennsylvania attempts were underway to make the executive budgets more explicit statements of policy through the use of programmatic information, although at a highly aggregated level. Pennsylvania had the most elaborate example of a dual budget presentation in which crosswalk data from organizational units to 15 programmatic categories were used to cut across instructional programs and institutional support activities. These attempts at changing the substance of review did not appear to have penetrated very deeply into the underlying budget processes. In Connecticut, this process was still dominated by a traditional object of expenditure review, and in Pennsylvania and Michigan the dominance of political forces in higher education resource acquisition considerably lessened the significance of technical or analytical review.

Executive budgets in California and New York, which were not referred to by budget analysts or state officials

as "program budgets," offered extensive narrative and support justification. In New York, legislative staff described this material as providing useful information for their budget review and policy planning. Both executive budgets, especially in New York, focused attention on particular budgetary issues, whereas the more traditional governor's budget, by comprehensively outlining all expenditure categories, gives little indication that some recommendations are more important than others. In some respects, the much criticized routines of program budgeting do a better job than traditional formats of condensing the enervating array of budgetary figures. But the condensation itself constitutes, of course, one source of executive-legislative conflict--over information and the format of the budget. The failure or inability to implement new procedures is hardly due to ignorance in the executive branch or to lack of leadership. Strategic and political constraints clearly limit the changes that are possible.

Perhaps the most unique governor's budget is that in Wisconsin, which maintains the integrity of the detailed budget categories, the Decision Items Narratives (DINs), of the original request. Major Decision Items grouped as *costs to continue, workload increases,* and *new and changed services* were itemized with justifications and the governor's recommendation on each item. The explicitness of these executive recommendations is virtually unique in the budget processes we examined. Other budget processes maintain the identity of original budget categories in executive-legislative review, but rarely for expenditure categories other than large aggregates. The only other comparable public statement of budget recommendations of which we are aware is that of the California Legislative Analyst discussed below.

Executive-legislative information-sharing takes place informally as well as through formal documents, but it should not be assumed that there is always a free flow of communication between staff analysts. Executive budget staff may provide data, but not the analyses and the budgetary implications derived from them. In other situations, executive and legislative staff may be shared, or they may

work together very closely, as they do in Kansas and Virginia. Where the governor does not have the dominant role in preparing the state budget, as in Mississippi and Texas, information-sharing often ceases to be an issue.

The California Department of Finance and the Legislative Analyst are a notable example of executive-legislative information-sharing. In order for the analyst's *Analysis of the Budget Bill* to be timely (it follows submission of the governor's budget to the legislature by less than a month), higher education requests, their analysis, and the governor's recommendations must go to the Legislative Analyst's staff substantially in advance of printing.

LEGISLATIVE BUDGET STAFF RECOMMENDATIONS

State executive-legislative relationships are sufficiently different from presidential-congressional interactions that few parallels can be drawn, especially in consideration of the number of variations in executive and legislative styles that exist in the states. Nonetheless, there are trends in the states similar to those apparent at the federal level toward obtaining more budgetary information from executive sources, formalizing legislative budget proposals, and developing more staff and analytical resources. The importance of the Governor's Budget as a unified statement of executive priorities, and its domination over alternatives considered in the budget process, cannot be overemphasized. However, the preparation of formal legislative documents indicative of legislative priorities (and containing or reflecting analysis by legislative staff) is becoming increasingly significant in broadening the range of alternatives considered.

Differences in executive and legislative perspectives on state higher educational policy, and differences in political influence are discussed in Glenny (1976) and Schmidtlein and Glenny (in preparation). As is apparent from these discussions, there is increasing debate over the necessity for legislatures to increase the size of their staff bureaucracies and growing concern over the

implications of the increases. The polarity that can develop between staff over information because of diverse executive and legislative policy perspectives was nowhere more apparent than in Michigan. Yet other states in which legislative staff pursue equally aggressive analytical roles appear to have worked out acceptable solutions to information reporting and the division of responsibility in budget review.

To summarize: We have restricted our attention to formal documents. Their implications as to the level of legislative staff activity must be qualified by noting that legislative staff may make budget recommendations to budget committee members internally without the use of formal documents. In addition to those staffs described below, such recommendations are made by legislative budget staff in Colorado (Joint Budget Committee), Florida (House Ways and Means Committee), and New York (Senate and House Appropriations Committees).

In Mississippi and Texas, the agencies we have labeled as legislative agencies are staff to a commission or board which includes either the governor (Mississippi) or the lieutenant governor (Texas). Consequently, such agency staffs are not strictly comparable to staffs of joint or separate legislative budget committees; the formal documents these agencies prepare are comparable to many executive budgets in comprehensiveness and format. The commission budget was the only comprehensive state budget in Mississippi and there was, in effect, a legislative budget in Texas. The higher education portion of the *Budget Report* of the Mississippi Commission of Budget and Accounting was consolidated, even though the requests it received from the statewide governing board were aggregated, but this consolidated format feeds directly into the format used in the appropriation bill. The Texas Legislative Budget Board's *Budget Estimates* were aggregated and comparatively detailed at the institutional level (approximately 15-20 lines per institution). Similarly, these budgetary items furnished the categories of the appropriation act. Neither of these documents included narrative explanation or other justification.

Although the Nebraska budget process itself is unlike that in Mississippi or Texas, the Nebraska Legislative Fiscal Analyst and staff submit a similar formal recommendation on postsecondary programs to the legislature. These recommendations were in tabular form and included two years of historical data on appropriations, current year estimates, the agency requests, and the analyst's recommendations. A separate volume (which we did not review) provided narrative and an explanation of the underlying assumptions and workloads on which the analyst's recommendation was based.

What were probably the best examples of legislative analytical staff documents were found in California, Kansas, Michigan, and Wisconsin.

In California, the analysis of the budget bill is prepared annually by the Legislative Analyst's staff, which serves the Joint Budget Committee but provides this report to all members of the legislature. The analysis ran in excess of a thousand pages, selectively covering the entire range of the Governor's Budget (itself a five-volume document) with recommendations and explanation. Postsecondary education programs were treated as one of the total range of state services. The units for recommendation were the multicampus systems (segments), but recommendations applied to specific elements and activities of the systems and campuses. The analysis was released immediately upon submission of the Governor's Budget to the legislature, which made clear that the Department of Finance had cooperated in making available their information and analysis and the thrust of executive recommendations. The Legislative Analyst's report is used as the agenda for legislative budget hearings.

The Kansas legislature had no staff on higher education for FY 1974-1975, but subsequently the Legislative Research Department provided staff reports to the House and Senate Ways and Means Committees. They are noteworthy as an illustration of what new staff can provide. The staff report on higher education consisted of a brief discussion of approximately a dozen general issues pertaining to all campuses, and specific issues pertaining

to the budgets for each of the six institutions. The format of the reports focused attention on the budgetary implications of these issues by providing background information and institutional comparisons but made no recommendation. The governor's recommendation was provided as a reference point.

Until 1971, the Michigan legislature was staffed for budget review by the Legislative Fiscal Agency. In 1971, a separate House Fiscal Agency was established and the name of the Legislative Fiscal Agency was changed to the Senate Fiscal Agency. These legislative budget staffs prepare specific recommendations for fiscal committee members, but these are not public documents. The only formal public document prepared by the staffs is the *Summary of Net State Appropriations to State Supported Institutions of Higher Education*. This is a so-called "tracking summary" of state funds to colleges and departments within each institution (Arts and Sciences, Fine and Applied Arts, Education, Nursing, Business, etc.) and to seven other support and public service functions (activities) which the Michigan public institutions have in common. The tracking summary is used to describe the purposes for which legislative appropriations are made, and it therefore supports the appropriation bill which the legislature passes. Its use in a budget process was unique in the 17 states we examined, and it evidently had resulted from the juxtaposition of information deficiencies attributable to a high degree of institutional autonomy coupled with executive and legislative disagreement over the use of program rather than organizational unit data. The executive budget office has introduced a number of program budget reforms into the process and program categories were used in the governor's budget. However, the legislature has continued to want data on specific organizational units, and to make its own requests for this data from the institutions. It is not entirely clear whether the data actually being provided to state agencies in Michigan was appreciably more detailed than in other states, but it was certainly more voluminous and difficult to reconcile because of the lack of coordination between the executive and the legislative budget staffs.

The staff of Wisconsin's Legislative Fiscal Bureau prepared issues papers for the members of the Joint Committee on Finance, but they did not appear to be public documents in the sense of most legislative staff documents. In addition, a summary comparing major budgetary provisions of the Governor's Assembly and the Conference Committee Recommendations was prepared at the close of the session. Language from the Budget Bills was included, but this was not an analytical document.

Formal legislative budget documents neither suggest the full measure of legislative budget staff activity nor its influence on the budget, but they give an indication of the extent to which legislative review is assisted by information reporting and analysis. Where legislative budget staff are involved in preparing a comprehensive state budgetary plan, their analytical activities will be somewhat broader, but in most other instances legislative staff can be very effective in filtering the available mass of information and focusing legislative attention on the few key items for which substantive choices can be made during each budgetary cycle. Where no one else performs this function, elected officials, especially legislators, are likely to be overwhelmed with technicalities and therefore have no alternative but to make budgetary choices entirely on the basis of, "Who gets what" rather than, "What is this bureau or institution doing?"

These formal documents and the staff activities that support them have another consequence which is frequently overlooked. When asked how current fiscal conditions in his state had effected the budget process for his institution, one institutional vice-president commented that the effect on the process had been slight and went on to emphasize that the form of the appropriation bill had not changed. Obviously, the culmination of the budget process in a budget bill is the act that posts the "final score." But this overlooks the manner in which staff documents, particularly those which have a proximity to the appropriation bill, can be and are being used to control or influence execution of the budget.

The "stump" approach to budgeting, whereby the legislature puts an appropriation on a stump and the institutions take it and run, has been largely abandoned, if not through language of legislative intent inserted in the appropriation bill, then by the fact that institutions must come back to the legislature in subsequent years to be confronted with the formal documentation and analysis of budget processes from prior years.

6.

Payoffs from Analysis and Information Systems

Evaluating the consequences of improved information and analysis in the budgetary process is especially difficult because there has as yet been no comprehensive implementation of information systems and sophisticated forms of analysis. A questionnaire survey by Barak (1975) indicated that, at most, a handful of states have developed management information systems which meet a set of formal criteria for total development and implementation. Our impressions from site visits in the 17 states agree quite generally with the survey responses reported by these same states for the Barak study. Furthermore, for implementation to take place at the state level, considerable development work must already have been done at the institutions. Yet, in responses to the survey by Bogard (1972), only 24 percent of the institutions reported having a full-time office of institutional research; 13 percent had computerized management information systems; and 31 percent used some form of program budgeting. Only 2.8 percent had all three.

These surveys of implementation admittedly reflect only superficial evidence of implementation and use of systems because of the difficulties in defining exactly what these systems are. In comparing the characteristics of information and management analysis systems in Florida and Wisconsin, two states widely regarded as being relatively advanced, one finds considerably different systems. Furthermore, in emphasizing the formal procedural features of these systems, one loses touch with qualitative and contextual factors which are ultimately more important

than techniques. A state with all the formal routines and documents of PPB may actually be reviewing budgets with very little attention to the PPB presentation. Another state may conduct traditional line-item review with periodic attention to agency performance studies. In which of these states can one expect payoffs from new information and analysis?

Paradoxically, in spite of the inability of budget reformers to fully transform the budget process, a great many states, if not all, have altered higher education budget formats and information reporting procedures in the last five years. Fenno (1966), Merewitz and Sosnick (1971), Wildavsky (1964, 1966, 1969, 1972), and numerous other critics of PPB have explained why the PPB process is unworkable and cannot be implemented comprehensively. But these observers have given relatively little attention to the significance of the many incremental changes that have been occurring in the budgetary process. Like Marxist explanations of fatal flaws in capitalism, these critics overestimated their capacity to deal PPB a death blow by their criticisms, and instead have brought about its gradual reform.

In his discussion of the payoffs from urban information systems, Downs (1967) argued that the provision of urban services is finally the true measure of benefits from these systems. Many protagonists of the use of information and analysis in management have emphasized that improved efficiency will be the outcome. College and university budgeters maintain that unless the use of new budgetary procedures results in significantly different levels of state appropriations, they are not worth the effort. Although we tend to agree with Downs. the impossibility of evaluating payoffs of information and analysis, in terms of their influence on higher education services, was implied by Corbally (1974), the president of a major public university:

> Regardless of the data that our machines produce, regardless of the reports and information that underlie our administrative decisions, the teaching-learning process remains basically constant. (p. 3)

He further observed that educational effectiveness may remain at its peak until an institution's final day, even though ineffective management has led to bankruptcy and closure. The separation between teaching, the primary task of colleges and universities, and administration is so great that any relationship between educational outputs and administrative procedures is very tenuous. Thus, we see no way to evaluate the contribution of information and analysis by the final educational product. Is the performance of a university president, for example, measured by the knowledge of graduates of his institution, or by the starting salaries of graduates on their first job?

Given that public budgeting in the 1920s was conceived as a device for reducing governmental expenditures, for clarifying governmental responsibilities, and for securing significant governmental reforms, we should look now to similar concerns as the underlying sources of interest in budgetary reform in higher education. Higher education services and objectives, as well as its efficiency, are involved, but in the fundamental way described by Bailey (1973) and not simply as a problem of resource management:

> Only the woefully naive contend that the real problem is efficiency--that government bureaus and universities will receive votes of confidence when they can master PPB (program planning budgeting) and related cost-benefit techniques and thereby be held accountable. The basic issue is political and psychological--a growing belief that what government bureaus and universities do is not worth the cost: that governments reduce freedom too much, and that universities foster too much license. The absence of sophisticated systems of accountability simply adds to the already substantial frustration of politicians and publics. (p. 133)

If analysis and information systems are to produce changes in higher education performance, institutional administrators and faculty must sense a performance gap between what institutional outputs are and what they might be, rather than maintaining with Corbally (1974) that the teaching-learning process is constant and independent of administrative factors. Although state executives and legislatures show dissatisfaction with institutional performance by mandating faculty teaching loads and by increasing amounts of control and expressions of intent in appropriation bills, they do not know exactly what they want from higher education, and much less exactly what they can get. Our interpretation is that, as a substitute for controls on activities and operations of institutions, legislatures and executives are turning to budgetary procedures which show that responsible college and university administrators are at least procedurally accountable for doing the "right" thing. Centralized information reporting systems attempt to increase the flow of information at all organizational levels so that administrative decisions can be checked against relevant data or checked procedurally to ensure that supporting data was available to those making decisions.

Schick (1971) treated the general consequences and problems of implementing information and analysis systems in budgeting in his discussion of PPB reforms in the states. Silverman and Gatti (1975) reported on some technical problems associated with the Pennsylvania PPB experience. The innovations associated with PPB have been thoroughly critiqued by Wildavsky in a number of publications, as well as by others noted previously. In general, critics of information and analysis reforms have emphasized the procedural defects, and advocates have stressed the technical advantages. Both the procedural benefits and technical problems of increasing the availability of information and analysis in the budget process appear to be the most often overlooked consequences. In the discussion which follows, we therefore restrict our attention to the procedural benefits and associated technical problems. A discussion of the power and influence implications of information and analysis trends described in earlier chapters concludes the chapter.

PROCEDURAL BENEFITS OF CENTRALIZED INFORMATION AND ANALYSIS

It seems almost axiomatic that better information and analysis lead to better decisions, and hence, to improved management and planning. Unfortunately for purposes of proving or disproving the point, we are not dealing with alternative processes of production, one with good information and one with poor information, for which different decisions yield correspondingly different outcomes. Moreover, in public sector management the criterion ultimately applied to define good or poor outcomes is the political one: Do constituents and interest groups approve?

Cheit (1975) indicated his tentative belief that institutional planning and management have been improved as a consequence of implementing management systems, but noted that this is only an impression and that little evidence could be mustered to prove it. No evaluation studies in the interim have provided that evidence, nor are they likely to resolve that question to everyone's satisfaction.

The formal budget process reported on here, emphasizing staff roles, is an adjunct to the political process; hence, the ultimate standard against which payoffs from changes in the budget process must be evaluated are political in nature. As noted earlier, much of the criticism of recent budgetary reform has centered on the failure of these reforms to satisfactorily meet political criteria. Therefore, we begin with a discussion of the process benefits we believe are associated with the use of centralized information and analysis systems.

EQUITY OF BUDGETARY OUTCOMES WITHIN HIGHER EDUCATION

Free and open exchange of information and analysis fosters equity in the determination of budgetary outcomes. Although fair and impartial budgeting procedures can go a long way toward satisfying budget participants that the allocations they eventually receive are equitable, analysis

of those appropriations in relation to objective factors is an important ingredient in influencing perceptions of equity.

Rivlin (1971) explained the weakness of analytical methods in determining interprogram allocations as related to their inability to compare diverse program benefits, but notes the prospect of demonstrating through analysis what implicit weights are attached to alternative programs by the political process. A convincing case has been made by Steiner (1974) for a sequential decision model in which decisions about the total level of expenditure and relative size of major federal programs are made sequentially rather than simultaneously. Accordingly, the total budget is fixed, and then major program segments are backed out. Interprogram choices, therefore, are constrained by prior decisions, although they may be more flexible. While Steiner's sequential decision model was intended to describe the federal budget process, it agrees completely with our impressions of state-level budgetary practices. Thus *ex ante* analyses of budgetary outcomes most likely do not effect the distribution of appropriations across programs (say, highway construction), but they can be a factor in intraprogram allocations (for example, within higher education) because there decisions are more likely to be simultaneous rather than sequential and because program outputs, workload levels, and other indicators of budgetary need are more likely to be comparable.

A budgetary dialogue that includes information and analytical input covering all of higher education, as well as information on how budgetary decisions are reached, is conducive to a more objective process, one in which special treatment and privilege are made more difficult to dispense. The role of information and analysis in higher education budgeting is least well-developed in states where the allocation among institutions is overtly political. Equity in these states is achieved principally through "logrolling," and probably at a somewhat greater cost to the state's taxpayers.

INSTITUTIONAL CREDIBILITY AT THE STATE LEVEL

Institutional credibility at the state level depends greatly on interpersonal and interagency relationships, and it can be undermined as well as supported through exploitation of the opportunities for clouding or clarifying issues through information reporting. Credibility (and trust and confidence) do not follow alone from procedure--from doing PPB, as it were--what count are the content and legitimacy accorded information and analysis.

Cheit (1975) concluded that the credibility of higher education institutions is not much improved by new information and analysis procedures, but this conclusion was based primarily on information and analysis systems as instruments for improving institutional efficiency. It is true that protagonists for these systems have emphasized their ability to improve technological efficiency, but in practice improved efficiency in operating a public service agency means primarily lowering expenditures or lowering the rate of expenditure growth, which is to say, in the current vernacular, retrenching. If that alone is the goal of state agencies, then it can be achieved much more easily within the confines of a less analytical budgeting procedure. State agencies can request that institutions submit budget requests within 105 percent of last year's expenditures, for example. Howard (1973) and Schick (1971) both commented that budgetary formats which include supporting program and fiscal detail do not seem to be favored by political administrations seeking retrenchment. Providing the information to support cutbacks programmatically and in terms of service outputs also opens the opportunity for requesting increases on the same basis.

Expenditure cutbacks have become a reality in a few states, but most public institutions continue to receive budget increases when state revenues permit them (Ruyle & Glenny, in preparation). Although it will not be universally true because of the presence of other factors, some institutions and systems have found it distinctly to their advantage to take an "open system" approach in making information available to state agencies because

this provides an opportunity for them to credibly substantiate budgetary needs. In several instances, introduction of information reforms has been tied to reductions in state personnel system or other controls, or to more favorable budgetary recommendations on appropriations.

While information and analysis may contribute to a more receptive state-level review, whether the result eventually will be a higher level of higher education appropriation is not really an appropriate question. All governmental agencies are underfunded, if one were to judge by the level of funds they request versus the level of funds they receive. It is certainly the rare agency which does not receive a budget appropriation below the amount requested. If state revenues are available, higher education may receive marginally greater appropriations, based on relatively gross political considerations. Institutions may get greater appropriations based on technical factors as well, although with the bias in state-level budget review necessarily toward reduction, good technical support usually only prevents an institution from losing funds. In one institution examined, however, the use of special analytical studies to demonstrate deficiencies in their funding did result in greater higher education recommendations for that institution and subsequent increased funding. The adoption of certain budgetary classifications also may be encouraged by the promise of greater appropriations, although it is not clear that such presentations are all that is needed to convince state officials. Certainly by using program classifications or various workload measures, it is easier for an institution, on the basis of its documents alone, to justify additional budget requests. Some institutions bolster their budget justifications considerably by using the rubric of program budgets, special studies, and program and mission statements.

Miller (1964) noted that the development of formulas could serve as a vehicle for improved communications between institutions and state agencies by requiring the productive involvement of state agency staffs earlier in the process, and of institutions in the latter stages of the process. He identified the cost to institutions as

a willingness to agree to compromises on their requests, and the cost to state agencies as a willingness to refrain from arbitrary decisions during joint phases of the process. "The overall result . . . is that each participant is better informed and had a longer period of effective participation and influence" (p. 83). The same can be said for reasonable exchanges of information and analysis in the budgetary process which, in essence, are only less highly stylized and structured substitutes for the "guidelines" and "aids to calculation" provided by formulas (Meisinger, 1976).

SUBSTANTIVE BUDGET DIALOGUE

Introduction of information and analysis into the budgetary process can shift the focus of disagreements from what the facts are to the implications of those facts; that is, what programs should receive state support? As a consequence, the budget dialogue becomes more relevant to the ultimate purpose of the budgetary process, the determination of policy. Systems for information and analysis have freed some state higher education agency staff to devote more time to policy issues, and they can make it possible to respond quickly with information and analysis when issues are raised during the legislative process. The inability to respond at such times with reasoned support can lead to the imposition of relatively arbitrary budget cuts.

An analytically based budget process tends to raise the level of sophistication of the budget dialogue by adding another dimension to communications. Instead of preferences alone, objections or support can be raised on matters of substance. In a bargaining situation, information is power, but so is lack of information. Bargaining depends on getting someone to believe something, and the availability of information, or the lack of it, may be crucial. We do not know that substantive information and analysis lead to better decisions, but most administrators believe that access to adequate and relevant information is a characteristic of a good decision process.

Critics of the substance in the dialogue of public decision argue that consensus may be facilitated by debate over more easily resolved matters of fact. But decisions tied to relatively inconsequential matters do not establish policy, and as a result may establish a tradition of arbitrary and capricious decisions. One can gain as well as lose from seemingly arbitrary choices, but on the whole analysis raises the tough questions required to stimulate adequate evaluation of new and ongoing programs in relation to policy. And it may eventually supplant the questions raised solely for political purposes--about the president's salary or the reasons why an interested person's son was not admitted to medical school.

From a societal rather than an individual point of view, choices made from the broadest possible set of alternatives are more likely to meet the requirements of changing social preferences than choices made from alternatives constrained by lack of information. Information and analysis can force attention to problems that would otherwise receive little attention. Current fiscal difficulties in cities and universities offer good examples of instances in which available options were reduced by the postponement of attention to critical problems that might have been raised by better information and analysis. Consensus, however, is not so easily achieved.

By and large, few would argue against the advantages of a more substantive budget process, but there is doubt as to how systems and procedures can be used to accomplish such a process. Bowen and Glenny (1976), in their study of institutional response to fiscal stringency, found that retrenchment and midyear budget cuts have added urgency to the review of existing programs and accelerated interest in and use of allocation procedures based on more substantive program measures. Further, Exhibit 10 shows that in any year, the activities of a budget agency may involve preparatory planning, budget preparation for the coming fiscal year, execution of the current budget, and postaudit. When revenue expectations force a cut in expenditures for the current year, the question of the

Exhibit 10

OVERLAP OF BUDGETING PHASES

	Year (t)			
	t	t+1	t+2	t+3
Budget for last year (t-1)	Post-audit			
Budget for current year (t)	Execu-tion	Post-audit		
Budget for year t+1	Develop-ment	Execu-tion	Post-audit	
Budget for year t+2	Pre-paratory planning	Develop-ment	Execu-tion	Post-audit

consequences of the cut for postaudit evaluation and development and planning for subsequent budget years is immediately raised, and more substantive planning and allocation procedures may result.

STIMULUS FOR ORGANIZATIONAL CHANGE

Although organizational change is not always for the better, frequently a far greater problem than slowing the rate of change is how to achieve any organizational innovation at all. Examples of the ways in which the development and implementation of information systems have stimulated change in the management of higher education, in addition to changing other practices in higher education, could produce a very large report. One cannot often claim that such changes have necessarily been stimulated by information reporting and analysis; it is somewhat more likely that the resources to develop and implement an information system and the interest in it provide an infusion of energy that is then rechanneled in various ways.

Information task forces may serve some of the same purposes as formula development committees in providing a focus and a forum for discussion of management-related issues. Analytical studies and performance evaluation audits, which are sometimes misdirected or ill-conceived in themselves, do tend to have the effect of releasing pent-up energy within the system, and this in turn results in administrative revisions. Analytical studies and evaluations also may bring problems to light which can be remedied, even when the original issue is insoluble or misconceived. As such, these studies may indeed represent solutions in search of problems, but that may be all that is feasible. (See Schmidtlein's dissertation, 1976, for a discussion of the outcomes of Department of Finance audits in the University of California library system.)

"ORGANIZATIONAL MEMORY"

When procedures for information submission and analysis focus and condense the issues relevant to a given annual budget review, as well as produce a historical record of them, the budget process may avoid repeated "rediscovery" of these issues and their solutions. Discussion and analysis can facilitate the achievement of agreed-upon goals by reminding participants of previously established facts, premises, and conclusions. When the discussion of these issues is not formalized with good information and documentation, the issue is often lost as a reference point, and institutions and state agencies may return to the issue in circular fashion in succeeding periods. Because of the relatively high turnover of personnel in state agency budget staffs, particularly junior personnel, these agencies, compared with other agencies, tend to have relatively limited organizational memory.

TECHNICAL PROBLEMS WITH INFORMATION AND ANALYSIS SYSTEMS

The problems commonly associated with information and analysis systems concern their failure to meet certain political process requirements. For a discussion of these issues, which helps to explain the inability of system designers to implement their products, see Glenny (1976), Schmidtlein and Glenny (in preparation), and the "critique" literature referred to earlier. This section considers the technical problems confronted in implementing and maintaining budgeting information and analysis systems. While efforts to reform information gathering and analysis have fallen far short of those called for in full-blown PPB systems, state agencies and institutions are making changes in established budgetary procedures. The assertion made by detractors of PPB, that "no one knows how to do program budgeting" (with its implication that no one need worry about the nitty-gritty details of implementation), is not much help to an agency trying to design improved, workable information and analysis procedures.

NONCOMPARABILITY OF DATA

Perhaps the most frequent information deficiency mentioned by budgeters is the lack of comparability of data submitted by institutions within the state. Although institutions use common accounting structures, this in itself is no assurance that common practices are being used in allocating costs or applying definitions. Institutions in many states continue to use personnel and purchasing systems of their own design, with various results. Responsibility for salary levels and for filling positions may reside at the departmental dean level, for example, and consequently state-level involvement in applying standards and classifications may, at least for academic positions, be virtually nil.

Lack of comparability also stems from the varied characteristics of institutions, especially those engaged in research and graduate instruction. An inspection of college course catalogues comparing even those institutions which have similar missions in graduate education and research usually reveals that institutions go to great lengths to differentiate their course offerings. Thus, any comparability of educational outputs is forced, unless individual courses are made more similar or course and discipline area designations are made more precise. Two economics departments, for example, one of which is heavily oriented toward mathematical economics, econometrics, and managerial economics, and another that is principally an economic history department, will have quite different cost and workload measures.

Differences in departmental organization among campuses require the use of common course taxonomies, such as the HEGIS structure, which break any connection with program responsibility. Two specific examples found in the University of California system, but undoubtedly common in other states, are the existence of instructional programs in operations research and systems analysis, both in schools of engineering and business administration, and programs in marketing in schools or departments of agricultural economics, business administration, and administration (which includes

public sector management). It is instruction, of course, that makes the largest single use of funds within the budget, and consequently, it is the function for which it is most critical that some minimal level of comparability be achieved. Short of the common course-naming and numbering systems being developed in Florida, comparisons of costs and workloads in the instructional area are severely compromised.

Noncomparability is also attributable to different institutional capacities for providing data. Apparently because of differences in administrative style and interest, some institutions have been developing their own management information systems for several years as part of some of the NCHEMS development project, or in connection with locally initiated efforts. These institutions are now much more capable than others in the state of providing information on costs or other performance measures when state agencies request it, although problems in making comparisons with other institutions are still likely to be present.

The prospect of achieving comparability of information on instructional support activities, which are not unlike activities of noneducational organizations, seems considerably better because there is greater similarity in practice and because common measures of activity level are often available to serve as common denominators. The impression should not be left, however, that because providing comparable instructional data presents difficulties, data on costs, activity levels, instructional outputs, and other measures are not being widely reported. However, the dangers in forcing comparability through changes in instructional practice, for which diversity is highly desirable, are mentioned almost universally. Although this study focused on the state level, it did not provide an opportunity to observe how accurately differences in institutional practice are perceived at the state level. Because institutional diversities obviously continue, comparisons among institutions in the course of budget review are, to some extent, always artificial. Budgetary decisions very rarely follow directly from such comparisons. What effect comparisons would have on budgetary

decisions, if made on the basis of comparable data, remains an hypothetical question. Institutions fear that some comparison may become the crucial factor in reducing their requests, and state agencies are noncommittal as to how they would use more comparable information.

DATA NOT USED

Use of data is difficult to judge, but there are numerous indications that a great portion of the data submitted to state agencies is not used in any explicit way. The admission of nonuse by budget analysts and other participants in the budget process seems unequivocal, and the small size of staffs of most executive and legislative agencies virtually precludes the regular analysis of large quantities of information. One must allow for the fact that state agencies legitimately request data they will use only selectively, as well as data for which there is a targeted or planned use. Nonetheless, nonuse of data appears to exceed such allowances when institutions are burdened with providing substantial quantities of information which can yield few, if any, positive effects because so much of it is scarcely looked at. In positing that lack of use is a problem, we ignore the suggestion of various critics that actual use of more of the data provided might constitute a far greater problem.

Some of the data reported are not used because they are somewhat artificial and do not provide a good indication of institutional plans or practices. Further, unusable and useless information swamps data that could be informative. A common problem of information systems, in general, is that once reporting is initiated it continues indefinitely, although this is still rare in state higher education reporting systems because they are so new. In two states we found data being reported at the state level that had been required under previous reporting systems, but were no longer used in the current budget or planning process. There is also very little tendency for new information to replace information previously collected. New information is almost

always added to that already being collected, and not only because organizations are slow to change. Once data categories and their definitions are determined, revisions upset the historical continuity for trend analysis and comparison. There is, consequently, always considerable pressure to maintain old structures and add new elements rather than consolidate and revise.

Routine analytical studies frequently cannot be used in the budget process because the issues raised during the course of review change from year-to-year. If studies are used routinely, they are likely to be highly structured cost studies that have virtually become a formula. When analytical studies do not have a well-defined use in the budget, however, they are easily shunted aside or ignored. If they do have an impact on the process, it is usually in highly simplified form or as ammunition in the bargaining process.

The requirement that certain data be included in budget requests often stems from a belief that the process of decision, from the department to the state level, can be influenced by forcing data into new classifications or requiring new kinds of data. Although we found many examples of new data classifications being used, the impact on budgetary decisions appears to be limited. In Hawaii, a programmatic presentation of the university's budget resulted in certain programs, such as the Educational Television Station, being treated separately. Previously, the TV station had been folded into the university's budget. In some instances, information on program detail, which is not related to organizational categories or the functional accounting categories that institutions use, is included with the submission for eventual connection with appropriation categories, but still receives little attention in the process of review. Generally, Schick (1971) described the new kinds of higher education information quite well when he asserted that participants are more likely to seek and use data which suit their preferences than to alter their behavior as a consequence of information availability.

Jernberg (1969), in examining congressional committee behavior, found that committee budgetary inquiry styles, determined by questions posed during hearings, did not change when the budgetary format used by federal agencies was changed. On the contrary, regardless of the manner in which budgetary requirements were presented, the committees on which he reported tended to follow particular lines of questioning dominated by concerns over agency integrity, agency capability and reliability, or agency performance. Agency integrity was examined with questions focusing on congressional oversight; capability and reliability through an object of expenditure emphasis; and performance evaluation through examination of program goals and achievement. A question Jernberg did not pursue, which arises naturally from the data he presents, is whether the style of inquiry which dominated each committee was related to the character of agency activities and functions. An agency, if we may call it that, like higher education, may be more effectively examined with reference to capability and reliability, to use Jernberg's typology, because oversight (in the state context, supervision) lacks legitimacy, and performance expectations are so difficult to establish. It is also likely that in a period of fiscal stringency, when there is a disposition toward reducing higher education budgets, there is also a marked tendency for state agencies to ignore much of the new information based on growth assumptions.

UNSOPHISTICATED COSTING TECHNIQUES

The emphasis on providing unit cost data of various kinds has been so great that we have singled it out for attention. Attempts to develop unit cost data also sharply illustrate the difficulties that confront attempts to apply sophisticated theoretical rational-analytic concepts within the routines and politics of the budget process. Because of gross variations in accounting systems, it has been no small task to change accounting conventions to the point that acceptably comparable direct average costs per student credit hour could be reported. This is the practice in several states considered in this study, and it is frequently the basis

for requesting workload increases for changes in enrollments. However, comparing institutional average costs as a technical solution to the problems of identifying efficient educational practice or ascertaining a direct relationship between funding support and average costs is on balance a nonproductive exercise. The comparisons are based on assumptions that do not hold in actual practice, and invariably adjustment and compromise are required when enrollments fall because of the realities of institutional operation.

The root of the problem is that use of average cost data assumes that increases in instructional costs are directly proportional to the number of enrolled students over the entire range of enrollment levels. Another way of saying this is that such cost data recognizes no differences between fixed and variable costs; all costs are assumed to be variable. It is, of course, a complicated matter to determine which costs are variable and which are fixed; in actual practice those that are fixed with respect to one decision may be variable with respect to another. Nonetheless, in times of growing enrollments, institutions have found it convenient to ignore these complexities and to request workload increases on the basis of average costs because their marginal costs were undoubtedly less than their average costs. Unfortunately, when funds are cut back under the same formula they discover, to their discomfort, the fallacy in the logic.

The computation and analysis load could well be unmanageable if regular attempts were made to estimate and use marginal costs, although this has been approximated during periods of growth through the use of graduated cost or workload standards based on increasing returns to scale. Reliance on average cost standards (ratios, costs, or other parameters) during a period of growth may allow some institutional flexibility through over-budgeting, but it is generally believed that the use of average-cost formula factors during the 1960s kept budgetary demands below what they might have been because realized enrollments exceeded forecasts. On

the downside, formula factors and standards give way, and their demise necessitates a sudden shift to ad hoc methods of funding which often lack any consistent cost basis.

Application of costing techniques also is hampered by the jointness of educational outputs when the instructional activities within the institution are treated as production processes. The use of physical plant, automated data processing equipment, libraries, and faculty and student inputs in activities that "produce" instruction of various kinds (regular degree programs at varying levels and extension), in addition to research and auxiliary enterprise outcomes, makes cost assignment a rather arbitrary process. Cost allocation conventions are used to assign costs in the absence of recharge systems, but this sets up a potential source of conflict between those who are attempting to cost outputs and those who must manage inputs. For management purposes, the dictum applied in industry--that cost reporting should be consistent with the managerial responsibilities of the various organizational units--conflicts with the attempt to assign costs to the variety of educational outputs which may have some value in the planning process. State budgetary planning is dominated by a philosophy of control and input costing which is much more consistent with the assignment of costs to points of management responsibility (cost centers) than with assignment on a programmatic basis, where responsibility almost always cuts across organizational boundaries.

The lack of comparability in expenditure classifications and the failure to recognize fixed and variable costs restrict the eventual application of program costs as analytical devices. Nevertheless, if the budget process can permit the flexible application of program costs, these costs may find wide appeal as cost indicators or in formulas. The attractiveness of formulas for institutions depends on the acceptance, on principle, of the formula as a device for requesting funds, but not for spending funds. Program costs based on the Program Classification Structure do observe such a principle, although it is not by design, if actual institutional

cost centers and decision points are sufficiently different from those implicit in the Program Classification Structure. Such a program cost structure has the effect of establishing an information veil which prevents state-level involvement in operating-level decisions, while at the same time providing information in aggregates that have potential uses in planning and coordination. However, limiting access to input and responsibility control data at the state level runs counter to current demands for satisfying administrative accountability.

DISTORTED INCENTIVES THROUGH WORKLOAD FACTORS

Problems caused by the use of average rather than marginal standards have led some states to apply the historically incurred average costs at the institution as workload factors for the forthcoming year. Although these budget estimates may be altered during subsequent negotiations in the budget process, this methodology has a tendency to build in historical inequities or differences. Another technique to blunt the sharp edge of enrollment changes is to use a three-year moving average of enrollments (or other workload element) to determine workload changes. This approach may reduce the severity of shifts caused by ignoring fixed costs, but it is unlikely to be responsive to factors that are the actual cause of the shifts.

Most states employing formula workload factors determine an average factor for all institutions in the state and apply this to the appropriate workload element to generate the budget estimate. If an institution is incurring higher than average costs, a formula of this sort will reduce its costs if the institution can cut expenditures fast enough to avoid a deficit.

Current accounting procedures in higher education lead to cost estimates that give very little insight for management purposes because they bear little relationship to the manner in which instructional costs actually are incurred. Such a methodology, coupled with the relatively inflexible use of faculty inputs,

will invariably show increasing costs whenever enrollment or student credit hour production declines. Rarely will an institution be able to reduce faculty or other factors fast enough to avoid a rise in unit costs. Thus, the level of unit costs is as much a function of the current growth trend of an institution as it is of any institutional or programmatic characteristic. To avoid increases in costs, institutions and departments are induced to stabilize or increase enrollments even at the risk of reducing quality.

ADEQUACY OF OUTPUT INFORMATION

Ideally, the program review should be separate from the budget process rather than a part of it, but there must be a bridge between the two processes which ensures that program planning decisions are reflected in the budget. Currently, much of the programmatic information only adds bulk to budget submissions, and the program review process is completely isolated from the budget process. For valid program evaluation, information on outputs is needed that goes considerably beyond the "assemblyline" measures that are included in most budget submissions, namely, degrees granted and student credit hours produced. Educational value-added, labor-marked supply and demand conditions, student preferences, program quality, and the like are far too complex to be introduced into the routine calculations that characterize most of the budget process. One state requiring this exacting information on program outputs, Hawaii, was not able to use it in any analytical manner in the budget review process. The university was under some pressure to reduce the number of output measures to a more manageable number, but these measures are probably among those that would be most useful in program review. (See output measures for the University of Hawaii in Chapter 4.)

DATA QUALITY AND CREDIBILITY

We have emphasized repeatedly that budget data consists, in large measure, of estimates of expenditures

for future plans. Where these data do not reflect actual institutional practice or intentions, credibility suffers even though institutional autonomy may be maintained. A lack of confidence in the data provided by institutions carries over into the results of studies of various kinds, as for example, faculty activity analyses, which uniformly have very low credibility at the state level.

Higher education institutions are in a unique position vis-à-vis other state agencies because they have a variety of funding sources. Generally, data on the magnitude of these alternative sources are available to state agencies, but often (where the institution feels it can reserve access to actual data) these data reflect only gross estimates. Usually no link is made between sources of funding and expenditures, and this effectively precludes state involvement. State agencies often request this information, even when the institution claims complete responsibility for its allocation and the credibility of the data is low.

It is difficult not to be impressed by the apparent accuracy and precision of quantitative results, particularly in the course of a process which itself must determine a quantitative dollar appropriation. This apparent precision frequently misleads politicians. The quality of budget data cannot be assessed by casual inspection, nor should it be expected that all inaccuracies can be removed. Expenditure estimates and projections of trends are necessarily speculative. Unfortunately, the quality of data is often assumed to have improved simply because it appears on punch cards or computer print-out.

MISUSE OF DATA

From our discussion of misuse of data, referred to above in the consideration of costs, it is apparent that a widely applicable criterion for data misuse cannot be specified because of the multitude of rationales that are applied in the budget process. In the course of the budget process, participants introduce data and conclusions derived from technological, economic, legal, political, and social principles.

What is reasonable from an economic standpoint (increasing the portion of educational costs paid for by students, for example) may be unthinkable in political and social terms. (See Diesing, 1962, for a discussion of this hierarchy of applied principles in a general framework and Fincher, 1975, for a discussion of current problems faced by higher education in these same terms.) Misuse in our discussion refers to misuse in a technological, economic, or legal sense rather than in a political or social sense because the former areas have more clearly established rules for determining error. Political and social rationales are also used to support and influence sociopolitical transactions and, of course, ultimately to dominate the determination of public choices.

As explained earlier, the use of average cost-formula factors has little support in technological or economic principles, but other redeeming qualities may make it an acceptable budgeting device. When used to reduce operating funds as a consequence of workload decreases, average costs are a very weak basis on which to proceed because marginal operating costs are surely lower than average costs. The use of direct costs of instruction rather than full costs moderates this deficiency somewhat, but the full annual per-student costs recommended by the National Commission on Financing Postsecondary Education as a budgeting device have no logical application under conditions of decreasing workloads.

Misapplications of other data also are related to lack of comparability. The practice of attempting to determine a standard for appropriation levels by comparing states on the basis of expenditures on higher education per capita, or by other measures of higher education support, is particularly unsuitable because of gross variations among states in the funds that are included in expenditure totals and in the costs of service. We found several instances of this argument used to increase higher education appropriations, and it is also used occasionally as an argument to limit funding. For a discussion and an example of the kind of analysis that is a necessary prelude to interpreting

these state expenditure data, see McCoy, Cherin, Makowski, and Weldon (1976). Although cross-state comparisons should not be used to discourage socially valuable differences between the states of a federal system, it is important to mention here that cross-state comparisons do have a useful application--but more in determining minimal standards for equality of opportunity than in identifying technically efficient practice.

A similar practice is the use of average faculty salaries at "comparable" institutions as a factor in formula calculations to support instructional budgets. We do not refer here to the common practice of including average faculty salary data compiled either by the American Association of University Professors or the institutions themselves as support for faculty salary increases. The practice of costing faculty salaries at levels found in comparable institutions appears to be an application of the notion of opportunity costs. Under this cost concept, the cost of any factor is the highest price that would be paid for the factor in alternative use. Although advocates of allocating funds to public agencies on the basis of benefit-cost analysis might approve, the advancing of opportunity costs to support a request for higher academic salaries at the same time that other factors are costed on a historical basis cannot be justified except on grounds of expediency. Funds generally are not allocated on an opportunity cost basis if they are appropriated.

THE DATA PROVIDED BY INFORMATION SYSTEMS

In any in depth review of a particular budgetary issue, the data required for adequate review are likely to be details and specifics rather than uniformly comprehensive program or functional activity data at a fairly high level of aggregation. Budgetary information systems are not very good at specifying much of this data before the budget is submitted because institutions may actually define issues by the nature of their request. Program budget classifications, or for that matter all functional classifications, usually aggregate

all expenditures and do not separate out the details for specific new or changed programs so that these can be examined. The depth of information is frequently uniform across the budget when what is needed is greater depth on the few issues that can be effectively reviewed in any one budget cycle.

Because issues change from year to year (even though programs and functions may not), budget agencies reviewing issues may require information of varying kinds. This frequently leads to requests for information that is not collected routinely because systematic collection of all this information would require an information system of unmanageable size and cost. The assumption behind provision of program data is that the data serves as a basis for evaluative decisions on the effectiveness and efficiency of higher education activities. This is not, however, the function that staff analysts at the state level usually fulfill. Staff analysts must review the technical elements of the agency's request for proper costing and accuracy. Thus a comprehensive programmatic focus may prevent analysts from receiving the data they need, as well as fail to provide the issue orientation needed for policy decisions by upper-echelon agency officials.

Consolidations of data that have developed historically, whether from patterns of institutional or system governance or tradition, frequently do not combine well with the submission of new budget documents, such as program revision requests or program change proposals. For example, although budget data for the continuation of existing programs may be consolidated at the system level, information regarding requests for new programs, necessarily being more specific, must be at the campus level. But state agencies will have problems evaluating a proposal which is an increment to an undescribed base.

OTHER TECHNICAL PROBLEMS

A common fault reported at the institutional level is that most special information gathering efforts

stimulated by requests from systems administrations or state agencies rarely result in compilations or studies based on the data that are returned to the institution. While the studies may relate to system and state agency responsibilities, institutions still want to see how they stand in comparison with others, and may actually be able to use the data to greater effect in their own planning processes. When there is adequate feedback, errors in the data can be corrected and interpretation of the data facilitated.

The requirements of the U. S. Office of Education HEGIS reporting, and its associated heavy information load, have required that institutions devote considerable time and effort and the assignment of substantial ADP resources to preparing and submitting these data once this reporting capacity has been developed. Requests for data by state agencies can be filled quite readily if the HEGIS reporting categories are appropriate. Quite frequently state requests for information address specific organizational issues neither encompassed nor defined by the HEGIS categories. Institutions are then unable to respond appropriately because available reporting resources are already committed.

POWER AND INFLUENCE IMPLICATIONS OF INFORMATION AND ANALYSIS

The implications for power and influence of the increasing emphasis on technical budget review are discussed in the context of the full range of interagency relationships in Glenny (1976). For completeness of the present discussion, we sketch below the most significant themes associated with changes in information reporting analysis at the state level, along with our impressions of trends in the states.

Information and analysis are both cause and effect in that they may produce shifts in the locus of power and influence when they are introduced, while being, at the same time, an indication of existing power and influence relationships. Furthermore, there are two

distinctly different kinds of power-and-influence shifts in question. One is a tendency toward centralization--that is, a power shift toward the upper levels of the state higher education budget hierarchy; the other, a shift of influence toward administrators and staffs who control and understand the techniques and knowledge that are being applied in information and analysis systems. The present study can offer relatively little new concrete evidence that would contradict the widespread impression that both of these power shifts are indeed the dominant trends. This view also seems clearly supported by reports on the growth of staff in state budget agencies, the replacement of lump-sum appropriations with line-item appropriations, and the increasing number of decisions in higher education that must be reviewed or approved at the state level (Glenny, 1959, 1976; Schmidtlein & Glenny, in preparation). What is not so clear is whether these trends are actually having the dire consequences that have been predicted.

CENTRALIZATION

The underlying strategy in current attempts to increase the rationality or accountability of the state budget process for higher education has been to increase the information available at the state level. Although the availability of this information at the state level has led to instances of greater state agency involvement in institutional operations, much of this involvement has taken the form of second-guessing administrative decisions rather than attempting actually to make them. Direct involvement in educational decisions is strictly limited by the separation of educational and administrative functions within the institutions. However, state-level involvement in administrative decisions at the institutions in the form of centralized approval and review procedures is greatly facilitated by management information systems. The importance of systems as mechanisms for institutional control seems somewhat exaggerated when one considers that states with a long tradition of central control over state agencies

and functions (Connecticut and New York, for example) have been able to exert such control without the use of systems.

Additional doubt is cast on the role of these centralized information and anlysis systems in transferring instructional decision authority and responsibility upward when one considers the experience in one consolidated system of public higher education in this study. In this instance, central university administration had an information reporting system in operation which they and other state agencies felt served the budgeting function at the state level adequately. Central administration officials noted, however, that they could not get administrators at the campus level to use the information in managing their own affairs. Consequently, a pilot project is underway to encourage use of this information in campus management. In addition to this kind of difficulty in bridging the gap between campus and system or state-level administrators, there is an even greater difficulty in involving faculty in administrative decisions. The obstacles to making institutional management systematic though academic are implied in the quote below of a renowned teacher speaking to his colleagues.

> We can also be sidetracked into administrative functions. I remember wasting three entire weeks on preparing a budgetary projection to cover the next five years--a plan which was rendered completely meaningless by unforeseen and unforeseeable events. (Highet, 1976, p. 40)

Professor Highet would probably not be contradicted by administrative colleagues on the usefulness of most five-year budgetary projections as they are currently prepared, but faculty also ignore information on predictable events and actual choices.

Gross (1969) commented that centralizing information and analysis leads to centralized decisionmaking only if top-level officials want to use the information to make decisions. The acceptance of responsibility for decisions

at the institutional level has perhaps been abdicated as much as it has been usurped. There also are indications that state-level officials do not desire to make the reallocation decisions that accompany the steady state in higher education, but that they believe programmatic information and substantive analysis will assist institutional and department officials to make these decisions. This may be true, but institutions frequently deny that the information state agencies request is useful for these purposes. On this point see Bowen and Glenny (1976).

GROWING STAFF INFLUENCE

As the public sector has increased in size and complexity, the accountability of public officials has become more vague, and similarly, the specification of policy by elected officials has become less sharply defined. The differentiation of state government services that has followed on the increase in size has been, in itself, a major factor in shifting discretion from elected officials to administrative staff. To some extent, informed analysis has been used to complement staff discretion because of the lack of clarity in policy direction from elected officials. Considerable attention has been given in the recent literature on public organizations (Ellul, 1965; Wolin, 1960) to the loss of power by elected officials, especially legislators, and to the acquisition of this power by agency staffs of the executive bureaucracy. The development of information and analysis systems which serve this bureaucracy are frequently noted as factors in this shift of power and influence. Development of supporting staff for legislative communities is often part of an attempt to regain control of a complex executive bureaucracy, but legislative staff growth is also likely to be followed by a need for more information at the state level.

Increasing the free flow of information and analysis in an attempt to rationalize and objectify the budgeting process, and increasing the number of interested staff raises the specter of limiting political options. Staff in a number of the states visited commented that the

higher education portion of the state budget was one of the most political. Thus, there is considerable opposition to implementing these information systems in the higher education segment from many quarters and, at the same time, an increased interest in using them in an attempt to limit some of the politics. One staff director noted that the impacts of analysis and program evaluation are likely to be greater where the leadership function of either the executive or the legislature is weaker. But the introduction of these review activities is not likely in itself to be a causal factor in weakening the leadership function.

Considering only budget staff, there clearly are differences in the staff-line relationships of the executive and legislative branches of state government, attributable especially to executive responsibilities for preparing a comprehensive budget and executing it. As a consequence, executive staff have clear information requirements and review responsibilities. In those states in which the governor is not the elected official responsible for preparing the state budget, joint executive-legislative budget responsibilities require the legislative budget staff also to have rather clear budget information needs and review responsibilities. Where the legislature concentrates on review of the governor's budget, staff work may be substantially less technical and well-defined than staff work done in the executive budget office. The effect of this is that executive staff do have substantial influence, especially with respect to budgetary details, through their technical review; but those legislative budget staff not involved in putting together a comprehensive legislative budget have considerably less influence. This being the simplest and most direct way that staff influence is felt in budgetary outcomes, in those instances in which the norms of executive and legislative roles apply, staff influence is greater in the executive than in the legislative branch. Legislative staff are much closer to the elected officials they serve and, because of this, may exert a direct impact on specific issues.

Kingdon (1973), in a study of congressional voting decisions and the influence of various information and analysis sources, found that of various information sources, such as congressmen, lobbyists, publications, and the media, congressional staff were the least important. We have no data other than our impressions to verify or refute this conclusion as it applies to state legislatures, but our impression is that in a ranking on budgetary matters legislative staff would fare considerably better in terms of their influence, and that their rank in relation to other factors would probably be higher. Of course, there are great differences among the states, and it is certainly not clear that being low in terms of a ranking is in any way comparable to an absolute rating from very influential to not influential. Balutis (1975), in a survey of legislators and other close legislative observers in New York, reported that most respondents rated budget committee staff as either influential or very influential. Butler (1975) concluded that staff of the Texas legislative budget board were highly influential, although this would be expected because, in effect, the board prepares a legislative budget.

Other legislative staff are not so influential, as Kent (1975) suggested about Illinois. There are, of course, other staff analysis functions besides technical budget review which provide a means for influencing budgetary outcomes, such as the preparation of policy studies and program evaluations. With respect to dilution of the influence of elected officials, one generalization seems clear: Influence possessed by elected officials and staff is not fixed in amount, so that growth in staff influence necessarily decreases elected official influence. To the contrary, most state executive or legislative bodies which are influential are so, in large part, because of the capabilities of their staff.

STRATEGIC USES OF INFORMATION

Frequently, information and analysis practices are seen more clearly as the short-run consequences of established power and influence than as factors in the

gradual shift of authority. Institutions sometimes claim that state-level requests for information are made simply to place the institution on the defensive or embarrass it because it cannot provide the data. On the other hand, state-level agencies accuse institutions of using data submissions as "vindicators" of their programs rather than as indicators of program performance.

In most states, public colleges and universities are trying to increase their credibility with state budget review agencies by providing more information, more comparable information, and information of better quality. Institutions rarely volunteer information, however, there being considerable concern that some item of data provided will become the crucial piece of information that will turn a budget decision against them. Although trying to remain cooperative, institutions and multicampus systems are clearly not fully committed to centralized information and analysis systems because they do not want to legitimize additional planning, analysis, and decisionmaking responsibilities in the other agencies. Internal institutional "score keeping" that might at some point be used against the institution externally is often not done.

Greater use of information and analysis is often linked to more complex methodologies for justifying budgets. The more autonomous the institutions, the less likely that complex information will depict actual institutional plans and operations; even with relatively complex and detailed information, little control is achieved under these circumstances. Where possible, technical factors will always be used to institutional advantage in making budgetary requests. The end result is often a justification which is more difficult to comprehend and review, with no additional real understanding of institutional operations for the purposes of planning or state-level coordination. Meisinger (1976) has noted both the susceptibility of complicated budgetary methodologies to manipulation, and the eventual loss of credibility in some circumstances when requests have been formulated with complex and highly structured methods. Where there is less institutional autonomy, as

in state colleges, the prospects may be better that more exacting and complicated budget methodologies will provide mutual benefits for both state agencies and institutions.

Topics of informational concern vary a great deal from state to state, but the problem of providing information in a variety of formats and aggregations is one that is generally shared. Executive budget offices are usually interested in aggregates built around state-level programmatic considerations. Legislatures and their staffs have a predictably much greater interest in the organizational units to which appropriations are actually made. Where these norms of executive and legislative responsibility apply, there is a clear conflict between executive and legislative interests. Executive agencies must also be comprehensive in their treatment of the budget, particularly in states with strong governors. Where the legislative role consists more of checking than initiating, the staff can restrict its view of the budget to specific details and may not require comprehensive detail.

INFORMATION POWER

One state-level budgetary function which virtually all executive and legislative agencies are willing to assign to state higher education agencies is that of responsibility for state-level information gathering. However, by itself statutory authority to collect information is no guarantee that the information gathered will be both valid and comparable enough to be used in planning and budgeting. An agency must "spend" considerable influence and political goodwill with the institutions to assure their cooperation. Getting information is usually a manifestation of already existing power relationships; top officials are more likely to get data they request than staff analysts. The development of information and analysis is given a fairly high priority by state-level agencies in most states, but we found numerous examples of system development delayed by lack of funds from the state or by a conflict

with priorities at the campuses. Not surprisingly, some state higher education agencies have been unable to fulfill this information gathering function to the satisfaction of the other state-level agencies.

Information is power, but the tendency to treat information as a free resource overlooks the fact that in the state budgeting process information is not always disseminated or accepted when it might remove comparative advantages in negotiating budgetary allocations. Not only is information not a "free good" in the economic sense, because it costs something in both physical and political resources to acquire it, but its acquisition and use are restricted by constitutions, laws, and customs. Thus, "perfect information" as the standard of information availability for the exchange of private goods in a competitive market cannot be expected to apply to the exchange of budgetary information.

7.

Information and Analysis Systems: Considerations for Design

The previous chapters of this report have described the actual development of information and analysis systems which support higher education budgeting in 17 states. These operational alternatives in themselves suggest considerations for design, but it is now time to take a somewhat more prescriptive stance and discuss the direction which changes in the design of information and analysis systems should take if they are to be effective. We shall do this by posing a series of considerations which, depending on the characteristics of a given state's process, may have vastly different implications for state practice. We believe that awareness of limitations and alternatives, and of the underlying nature of data analysis itself will result in better procedures for analysis and data collection. Although several of our recommendations do appear to be broadly applicable, they are secondary to the broader understanding of the limitations and alternatives.

THE NATURE OF INTELLIGENCE FAILURE IN THE CURRENT SYSTEM

An interest in changing the present level of available information and analysis in the budget process can be taken to signify, at least implicitly, that present arrangements are inadequate in some respect. Criticism is frequently expressed, most often in general terms, that senior state-level and institutional administrators do not have the information they need, and that existing

information systems either compress and distort information, reducing its quality, or fail to filter out irrelevancies, producing information overload. If these information deficiencies exist, there must be consequences: Either the choices stemming from educational and administrative procedures based on this deficient information are inefficient in an economic sense, or the choices of educational outcomes that result from budgetary decisions, again based on deficient information, are somehow politically or socially inappropriate. It is presumed that either efficiency or educational outputs, or both, would be improved by changes in information availability and the extent of analysis. But the path to improvement is not wholly apparent because the exact nature of the intelligence failure is not generally clearly specified.

On the basis of our investigations in a variety of states, we would not argue that intelligence failures do not exist. Currently, there is some general dissatisfaction with the outputs and activities of higher education institutions with respect to the inadequate vocational preparedness of college graduates, the emphasis put by some faculty on research activities rather than instruction, and to some extent with the attention given to the highly qualified full-time student to the possible detriment of the less-qualified part-time student who may require new avenues for participation in higher education. There is also some indication that fluctuations in enrollment have not been anticipated by institutions of higher education. Certainly there is implicit evidence that changes in labor market demands for particular kinds of professional training have not been accurately anticipated either by institutions or students. However, if current information and analysis procedures are to be changed, it is essential to determine specifically how the current system is failing, and if it can be corrected by the proposed changes.

The aspect of the intelligence failure, if it can be called that, that most concerns those who would alter information and analysis systems in higher education, is the extent to which budgetary choices can be accounted for with explicit rational and supporting information.

To some degree, the increasing interest in requiring a minimum level of decision accountability as part of the budgetary and other administrative processes is symptomatic of a loss of trust in higher education faculty and administration. State agencies generally have considerably less post hoc control over the activities (e.g., budget execution) of higher education institutions than they possess over the activities of other state agencies. Consequently, changes in information reporting to the states are almost uniformly a substitution of ex ante control of higher education appropriations through the budgetary planning process for the post hoc control available for other state bureaus. Increasingly, some mechanism for insuring this same level of formal decision accountability is becoming a requirement for an acceptable and legitimate budgetary process. The logic behind such a requirement is increasingly difficult to fault under a financing mechanism in which public higher education raises a majority of its operating funds through the centralized taxing power of the state. Ashby (1971) has explained the logic of funding policies and institutional accountability in terms of alternative patterns of university responsibility to students, employers of graduates, the public-at-large, or the universities' own guild traditions. Clearly, the current interest in accountability arises from a divergence of views as to where this dominant responsibility lies.

The designed flexibility of funding formulas and other funding methodologies which have served to control the level of higher education expenditures in the past, and provided institutions with operating latitude sufficient to adjust to changing demands, is indicative of a tradition in which emphasis has been placed on the university's unique capacity to judge its own performance. An analogy has been drawn between managing an opera company and managing a university which illustrates the relationship between administration and faculty and the former's restricted ability to manage and be responsible for instructional performance. As with decisions concerning musical interpretation and performance in an opera company, decisions concerning the educational process are highly decentralized and in the hands of

a relatively autonomous faculty. The measure of management, therefore, is likely to be its ability to provide and manage resources and to foster work conditions conducive to high morale and creativity. Although this was not an issue on which data were collected extensively in this study, it appears that the most obvious example of intelligence failure in public colleges and universities concerning planning and budgetary matters is the limited flow of information from state and institutional administrators to the faculty. Before overhauling funding arrangements and supporting information systems, it is essential to identify current educational and information deficiencies and determine that changes will tend to foster improvements rather than exacerbate present shortcomings. If it is an adaptable and innovating system of higher education that is desired, budget models and information systems should be sought which allow for adjustment and diversity rather than those which foster bureaucratic routine and the entrenchment of procedures.

MANAGEMENT INFORMATION SYSTEMS AS PART OF THE TOTAL MANAGEMENT SYSTEM

The design and implementation of information and analysis systems sometimes fail to recognize that current information and analysis procedures are part of an existing management system which determines how decisions are made and who makes them within the organization. Furthermore, centralized information systems carry with them a model--usually implicit--of how managerial decisions are made or how they ought to be made. With due allowance for the fact that procedurally defined information flows and decision responsibilities are likely to be simpler than actual flows and responsibilities, a management information system is not likely to be implemented as intended if the information system and the management system are fundamentally inconsistent. In practice, either the information system is altered to neutralize those characteristics which oppose the existing management system, or to the extent that an information system can be imposed, the management system is altered to reflect the influence of information flows and analytical resources. Changes in

information flow and access are not neutral with respect to organizational power and influence.

Formal information systems are designed with a particular concept of managerial functions and activities in mind. Two divergent theoretical conceptions of what managers do illustrate how conceptions of management relate to the kinds of management information systems that will appear useful. One of the first models formulated is exemplified by a model of public management which assigns planning, organizing, staffing, directing, coordinating, reporting, and budgeting (POSDCORB) functions to administration. The distinguishing feature of this model is its representation of managerial activity in terms of a set of formalized normative principles and procedures, a feature it shares with other models of management which emphasize the unity of decision responsibility. Models of management which are based on the manager as rational utility maximizer have been used successfully in developing testable hypotheses about business firms and other organizations with no normative implications. However, as behavioral refinements have been introduced to make these models conform somewhat more closely with what managers are actually observed to be doing, a tendency has developed to make the underlying notion of managers choosing goals and acting purposively to achieve these goals a prescription for as well as a description of management. Management information systems designed with this conception of management will be designed for managers who define problems, seek alternative solutions to solve the problems, and make decisions on courses of action which will implement the solutions.

In searching for a more realistic description, critics of the POSDCORB model argue that managers cannot function and make decisions in the way that the model implies because organizational goals are often vague, ambiguous, and contradictory. In addition, a singularly best method for achieving any given objective very rarely exists; knowledge, responsibility, and authority cannot be consolidated sufficiently in large and complicated organizations to make this possible. Contrasting views of what top management actually does have been offered

by Braybrooke and Lindblom (1963), among others, which emphasize the remedial and fragmentary nature of managerial action. The popular literature on management also has produced many examples which stress the unstructured, nonquantitative, and time-constrained features of managerial work, all of which limit the application of the rational-analytical problem solving ideal.

Cohen, March, and Olsen (1972) went far toward bringing together theoretical models of management and popular description in their "garbage can model of organizational choice." They hypothesized an organization characterized by the lack of preference structures which satisfy the standard consistency requirements of the conventional theory of choice, an unclear technological relationship between organizational inputs and outcomes, and irregular and fluid participation. In such an "organized anarchy," they claimed, at least a partial uncoupling of problems and choices takes place.

> Such organizations can be viewed for some purposes as collections of choices looking for problems, issues and feelings looking for decision situations in which they might be aired, solutions looking for issues to which they might be an answer, and decision-makers looking for work. (p. 1)

Although all organizations from time to time may exhibit such characteristics, Cohen et al. asserted they are particularly conspicuous in public, educational, and illegal organizations. They did not prescribe this kind of organization as one especially suited for resolving problems, for that it certainly is not. On the other hand, there may be certain organizations in which the preconditions for a garbage can process cannot be eliminated, and in fact should not be eliminated. Their model emphasizes the ambiguity in group decision stimuli more graphically than most and implies the need for a different management information system. It also suggests why a state higher education agency, coordinating as it does a set of institutions which are well described, to some extent, as organized anarchies--Ashby (1971) has called

them benevolent and useful anarchies--encounters difficulties in gathering information that one might assume would be available to it. Part of the explanation may lie in the fact that the organizations involved do not have a hierarchical and functionally articulated organization.

Actual organizations and management systems are much more complex than these two models, neither of which treats the implications of multiple layers of management encountered in public higher education nor the division of labor between political officials and agency staff in the public sector. However, these models do suggest a contrast between the information needs of top officials, which are more likely to correspond to the current intelligence needs of the "garbage can model," and of agency staff whose work is less time-constrained, although more structured, and who therefore may make use of comprehensive, historical data.

Most, if not all, information systems are designed by staff working from a set of assumptions very much like those of the rational problem solving ideal. Consequently, the comprehensive and partially automated information systems designed primarily to meet the needs of staff performing routine budget review activities of checking and costing are not likely to provide the information needs of top management, which are more likely to be related to the evaluative functions of budgeting. Although an increasing number of attempts are being made to provide evaluative information by squeezing it into categories and formats that can accompany the formal budgetary requests, this information tends to be unsuited to the needs of top officials. The evaluative and strategic planning decisions which these officials make are more likely to require information that deals with programs external to the one in question, that is, the relationship of the program under consideration to the total array of state programs and to choices and opportunities about which there is as yet little hard or historical data.

DATA REQUIRED FOR PLANNING VERSUS CONTROL

Even though the data required for planning and that for control are fundamentally different, attempts to change the informational content of the budget request process have been directed simultaneously at improving both of these management functions. Program budgeting reforms have attempted to instill the budget process with planning activities by requiring information on institutional goals, program missions and performance, and alternative program activities. At the same time, changes in budgetary information have attempted to tighten the points of control by either increasing the number of appropriation categories or shifting their focus from agency inputs to activities.

Planning, in the sense of strategic planning policy choice, requires tangible detail about where the organization "is" currently and, at the same time, information about trends and selected "trigger" items that inform officials about expected developments and problems. Aggregates may have some limited use, but are needed less than details which sharpen understanding of future trends and their implications for current operations. Historical data, except those which help to identify future trends and indicate current status, are of even more limited use. Strategic planning is more explicitly evaluative than budgeting and tends to emphasize the merits of programs to the exclusion of costs. It requires data on the substantive features of programs across the full range of state activities more than it requires cost data about a single program. Evaluative data of this kind are likely to be highly speculative, and may be more easily communicated orally than in writing. Budgetary planning places much more explicit emphasis on costing out programs, and thus can rely on data pertaining to single programs.

The data important for budgetary control need not necessarily be more detailed in the sense of being disaggregated, however; what is critical is that control of information be concrete rather than conceptually ambiguous. The data must relate to actual lines of authority and responsibility, which means they must pertain to existing units of organization rather than, as they often are in

program classifications, to hypothetical ones. Furthermore, control data must describe or pertain to actual operating transactions which the agency or institution uses in its own administration. These control data are very likely to be concrete items of expenditure or aggregates of these that the institutions make in the process of routine operation. Control may also be maintained by relating institutional activities to a specific set of educational outputs against which institutional performance can be measured, in the same sense that control in a profit-making enterprise is maintained in terms of cost centers and profit-generating activities. The transactional data systems of profitmaking organizations produce information which is directly relevant to organizational objectives because the units of measurement for goals and activities are either the same or can be suitably converted. Therefore, control exercised through transactional data also serves to control organizational goal attainment, even though, for reasons given above, transactional data will not be very effective in strategic planning. The goals of higher education institutions, however, are not only considerably more ambiguous because they cannot be converted to common units of measurement, but their attainment is also farther removed from the day-to-day transactions within the institutions--especially from its administrative, purchasing, and personnel transactions. This effectively decouples the transactional data system, for which there is relatively extensive data, from information on educational outcomes as well as from other data that would be relevant to strategic planning.

Attempts to determine the emphasis on control versus planning in state budgeting, although imprecise, usually find a heavy emphasis on control (Friedman, 1975; Schick, 1971). The costs, in the broad sense of political costs, of being deficient in controlling the mismanagement of funds are very great; they are far greater, evidently, than the benefits that accrue from providing a precisely "correct" menu of public services as a result of strategic planning and successful meeting of contingencies. The risk, again in the political sense, is greater in allowing flexibility for the future than it is in maintaining control for the present. The economic costs of control

are also lower than the costs of strategic planning. Whatever the reasons, state agencies with responsibility for planning and oversight do emphasize the latter. However, institutions are likely to realize more flexibility under a system which emphasizes traditional object of expenditure review and allotment controls than they are under one in which state agencies do more planning. Aggregated object of expenditure allotments leave more discretion to institutions in terms of the purpose of expenditures than do functional, program, or output classifications which specify expenditure objectives more precisely.

Thus, in the budget request process, there is not only a significant difference in the characteristics of information required for the two different functions of control and planning, but also a tendency for state agencies to concentrate on one function to the exclusion of the other. At the same time, those who support more planning attempt to impress it on the routines of the budget process by including data that relate to educational outcomes and other program and policy considerations. Data for the planning process and the analysis that might prove useful tend not to be routine, however, and these therefore come into direct conflict with the rigidity, tight time schedule, information formats, and shallow detail of the budget process.

To separate planning from the budget process entirely is ill-advised. Indeed, we urge their integration, for influence in the control process is the principal means through which influence over implementation is gained. Nonetheless, the routines of the budget process effectively drive out the opportunity for the more speculative insight and information needed for the planning activity to have an effect. Because planning appears to be de facto removed from the budget process, which is to say, its influence and impact on budgeting cannot be--or at least has not as yet been--formalized or routinized, serious consideration should be given to conscious and deliberate, although less formal and routine, ways for planning to have an impact on budgetary decisions. In many instances, the planning detail included in budget requests, as they are now reviewed, is virtually of no consequence.

Effective techniques for bridging this gap between control and planning will be very dependent on the state context and on the quality and sophistication of the agency staffs. There obviously will be great variation from state to state in the extent to which it is deemed politically advisable for state agencies to improve their planning capability. However, coordinating agencies may find it to their advantage not to have responsibility for detailed budgetary review so that they can concentrate on the strategic planning process, with its very different informational demands. Likewise, executive and legislative budget agencies might find it a better division of labor if they concentrate on resource and fiduciary control and reduce their involvement in comprehensive program and policy review.

DIVISION OF LABOR IN BUDGET REVIEW

Other reports in this series have treated the question of effective differentiation of budgetary review and responsibility (Glenny, 1976; Schmidtlein & Glenny, in preparation). However, the present discussion of factors to be considered in changing information and analysis procedures cannot be complete without a reference to the implications of agency duplication of effort and lack of coordination. Clearly, a sharp delineation of responsibilities, both vertically between state agencies and institutions and horizontally among state agencies, would simplify and rationalize the budgetary process, reduce duplication and overlap of responsibility, and raise the level of coordination. The difficulty lies in the lack of criteria for making such a division. Various general normative principles distinguish, in theory, among or between the functions of elected officials and the bureaus (policy and administration) and between the executive and the legislature (the executive proposes; the legislature disposes), but these prove to be far too coarse to discriminate among the various state agency and institutional staff functions in higher education budgeting. In a bargaining context, unless one agency is widely presumed to be a source of objective and independent analysis and information, each agency will rely on its own own analytic and informational resources to some degree.

In studying the overlap of state agency review activities, we found, generally, that at most, one state agency does a really thorough review of higher education budget requests, that is, a review that is both comprehensive and goes into considerable detail. Where the state higher education agency develops the budget request, either the executive or legislative budget agency conducts a thorough review. Depending on a state's statutory delegation of responsibility and the historical role of the legislature, this agency may be the state higher education agency, the executive budget office, or the legislative budget agency. In most cases, the other agencies take a reactive stance and either do little or no technical review or merely check the recommendations of the reviewing agency. Most states have neither the agency resources nor the time to concern themselves with original budget submissions in detail in addition to conducting a further review of subsequent recommendations. One method for reducing the complexity of reviewing an entire submission is to focus on specific issues. This alternative review approach, patterned after that of the California Legislative Analyst, can go considerably beyond merely "checking" an earlier, more or less comprehensive review, and is the approach newly established staffs often attempt. Such multiple reviews, to the extent they do take place, usually impose additional information demands on the institutions. To the extent that this duplication of effort at the state level becomes a political problem, that is, an intolerable manifestation of agencies jockeying for competitive advantage, it must be settled through political means. To the extent that it is a technological problem, it may be moderated by the prudent use of suitably designed automated data systems. Rarely does it appear that the information reporting load, even though it might be more suitably coordinated, is the true source of interagency friction. The plea of an "intolerable load" may be just, but it is also almost always part of the arsenal with which this conflict is conducted. The source of the conflict is more likely to be quite basic disagreement over fundamental responsibilities in state government or the governance of higher education.

Even in the absence of basic disagreement, a probable problem is a lack of communication between agencies which perform a detailed review and those that subsequently check or test these recommendations. These latter agencies are sometimes thwarted in their desire to understand the basis of recommendations. Once an agency performs a detailed review and reaches specific recommendations, it is more likely to place its efforts in justification of the recommendations than in opening them for analysis.

The vertical division of labor is the heart of the institutional autonomy question, and the legitimated responsibilities in budget review have been determined, like the division of responsibility between executive and legislative bodies, through constitutional action, the passage of legislation, and evolutionary development. There is clearly no single optimum configuration, but rather numerous alternatives which evolved from the particular set of conditions existing in each state. Many of these have been discussed in Glenny (1972) and Schmidtlein and Glenny (in preparation). And as we pointed out in Chapter 5, the extent to which institutions or systems provide institutional detail to state agencies varies considerably. What is acceptable by all parties concerned in one state would be anathema to the participants in another.

Two criteria for providing access to information, which have been offered elsewhere, have shortcomings as precise guides to the provision of information, but they may serve some purpose as guidelines by establishing a point of reference. Unfortunately, they may run counter to the spirit of "sunshine" laws and freedom of information legislation. The first of these is the analog of the "need to know" criterion, which is applied in access to classified materials. Access to information is limited to information to be used in making decisions. Only information with a specified use, therefore, would be provided to those with legitimate responsibility for using it. Because the decision process, as we have seen, is so complex, this is not an easy principle to apply. The formalist model of problems, solutions, constraints, and information impinging on individual choicemakers is

clearly an oversimplification of group decisionmaking with multiple choicemakers in a bargaining context. Nonetheless, the current assumption--that the public is best served by having all information regarding agency choices made available to anyone who is interested--must be challenged. A distinction should be maintained between information communicated formally in public documents and public hearings, and that exchanged in private communications. For example, an institutional chief executive officer stating institutional priorities for budgetary alternatives in a public document will undoubtedly express them somewhat differently when he makes the same priorities known privately to a governor or legislative committee chairman. We all know that some of the best evaluative information comes from the candid and confidential impressions of knowledgeable individuals. Attempts to make this kind of evaluative information public can destroy its value or bring undue attention to those concerned by it. In attempting to do away with "politics" in public choice, such reforms merely ignore it.

The second criterion is that data for budgetary planning should only pertain to linkages between resources and inputs for the educational process, and should avoid routinized consideration of the hypothetical outputs of the process. Connections between resource use, inputs, and educational outcomes are certainly appropriate planning concerns over the long run, but they are, according to this criterion, unsuitable annual or biennial budgetary issues. The purpose served by this criterion is the avoidance of locking-in production relationships to what are subtle and unquantifiable educational outcomes. This principle is rather generally applied in budgetary practice, although budgeters may sometimes be convinced that they really are measuring educational outputs in student credit hours. Student credit hours are truly only surrogate measures of educational outcomes, albeit some would feel that even their use in budgeting determines and confines the educational process too severely. It is certainly true that innovative nontraditional programs can only be funded if this principle is applied because such programs do not measure student progress by traditional measures.

Formula budgeting has proven to be a workable solution for funding according to the principle of input and resource linkage. But it has run into difficulties when the inherent flexibility in the procedure has been abused by institutions or state agencies which have tended to view formula allocations as detailed work plans. Constrained revenues and falling enrollments have also proved difficult to handle within the formula framework (Meisinger, 1976). As information reporting becomes more detailed and disaggregated, state agencies and institutions logically seek the mutual accommodation and flexibility provided by a formula. Unfortunately, in the context of leveling enrollments, the application of simple formulas is unsatisfactory, a state of affairs complicated by the fact that the level of interagency trust is often below that required for the use of complicated formulas.

COMPUTERS IN MANAGEMENT INFORMATION SYSTEMS

New institutional information requirements largely arise from increased demands made by state and federal agencies; they are not merely a response to the ease with which new technology makes it possible to secure and process information. Still, the identification of information systems with the use of automated or computerized systems does suggest that a great deal of the interest in implementing these systems in higher education is stimulated by the prospect of a successful transfer of technology from industry to the domain of social policy. This orientation is so strong, and the technology of information systems so much more advanced than our understanding of public management itself, that initial efforts to meet new information demands are often focused on hardware and software systems rather than on information. This has obvious advantages as an implementation strategy because the agreement on information system technology exceeds that on the informational content of information systems. But this approach is also undoubtedly responsible for a large fraction of the mismatch between expectations from information systems and what is actually achieved. A key issue in altering budgetary information, therefore, is the role of automation in these systems and

the extent to which it contributes to the success of the system. We have already discussed automating the budget review process itself. Here we refer to the more comprehensive activity of automating the entire budgetary information support system.

In many instances, the large quantity of data that is called on to support the budgetary process makes automated systems attractive, if not essential. Unfortunately, these systems of themselves do little to improve data quality; when systems merely report information that has been untried in an analysis, the principle that unused data is usually "dirty" data operates with full force. Only when information is used in an analysis is there the likelihood that its deficiencies will be brought to light. A good example of this is the process of improving the HEGIS data, which is now underway as a result of use made of these data by the staff of the National Commission on Financing Postsecondary Education and at the National Center for Higher Education Management Systems (McCoy et al., 1976). Use of the HEGIS data has depended on the application of computerized analysis, but to a large extent their use in a policy context awaits further improvement in timeliness and quality of the data.

Automated systems and manual systems also have different capacities to cope with the so-called "80-20 rule," which dictates that large portions of a data base will receive very limited use. (Conversely, relatively few items in a data base get very heavy use.) Automated systems obviously handle much larger quantities of data with ease, but they are less able to filter and winnow that data for eventual presentation in a policymaking context.

Experience with the application of automated data processing in the corporate world suggests the administrative activities in the public sector most likely to benefit from technology transfer. For this purpose, it is useful to think in terms of levels of increasing sophistication in the application of computerized systems.

Level 1. Basic accounting, sales analysis, and automation of routine clerical tasks.

Level 2. Partial integration of separate subsystems and data bases with few automatic decision rules.

Level 3. Inventory control and production scheduling, formal optimization techniques, and sequential linear programming solutions.

Level 4. Simulations of corporate strategy, studies of budgeting alternatives, and plant location.

Analogous applications are readily found in higher education management, although there are fewer processes which correspond to Level 3 unless one equates the more hypothetical flows of the instructional process. Classroom scheduling at the institutional level is one activity in which computerized systems have been usefully applied. The extent of implementation of computerized systems at the various levels described is undoubtedly changing, but only at Levels 1 and 2 have there been very extensive implementation in industry. Level 3 is much more rarely achieved, and Level 4 is only at an experimental stage.

Using Anthony's (1965) classification of kinds of planning and control systems (strategic management, managerial control, and operational control) it is fairly clear that, because of computers' capabilities for performing a high volume of well-structured operations in a context of few interdependencies, computers will be used most in operational management and control, and least in strategic planning. Their greatest successes as decision-aiding systems have come in operational control situations involving logistics, schedules of project completion, and budget execution. Computerization is less valuable in managerial control or strategic management because of the nonroutine and less highly structured nature of the activities that must be carried out in performing these functions.

In one instance of higher education budget management, the use of an automated information system at the institutional operating level provided up-to-date information on levels of expenditure, and threby helped that institution spend virtually all of its state appropriation that had been subject to complicated allotment transfer and salary lapse controls. This graphically illustrates that it is at the operating level that management needs quick information retrieval. The higher the organizational management level, the less the need for instantaneous information retrieval and, consequently, the less the need for automated systems. Trend data for planning based on demographic, economic, and social characteristics can be maintained to advantage in a data base automated for retrieval by management.

A final consideration in the use of automated data systems is cost. Currently it is the costs of software--the developing of computer programs for data base management and analysis--that are critical, rather than the costs of computer hardware. Computer capacity is quite likely in oversupply, but the costs of designing software packages to handle unique data bases can extend beyond the resources that most state budget agencies can bring to bear. We found no cases where these costs had been carefully documented.

MODES OF INTRODUCING INQUIRY AND ANALYSIS INTO THE BUDGET PROCESS

Greater analytic capability in the budget process is sought principally through the introduction of information reforms, new procedures, and the addition of staff. Viable alternatives in information reform and new procedures can be determined by considering the range of practices described in Chapters 4 and 5. In initiating or augmenting analytic staff capacity, the principal concerns and considerations are the character of the staff as either "neutral professionals" or policy-advocates, the skills and expertise of staff analysts, the use of special studies as a substitute for enlarging centralized data systems, the use of program evaluation units, and the use of outside consultants.

Information and analysis systems can be thought of as attempts to apply so-called scientific methods to the process of organizational choice. An examination of alternative theories of knowledge may therefore provide additional insights to the organization of the "inquiry" function of the budget process. For an introduction to this approach, see the short summary on alternative forms of policy analysis by Mitroff and Pondy (1974). Any of the work of C. West Churchman, the originator of this approach to operations research, might also be consulted.

Staff usually can be expected to adopt a mind-set that corresponds to the role of their agency in the budget process. Thus, one does not expect the executive budget office staff to take a stance as neutral professionals in developing and formulating analytical support for the governor's budget policies. Nor does one expect this neutral stance in the staff of a statewide governing board. Legislative staff must often adhere slavishly to the sentiments and inclinations of the committee members they serve, and coordinating agency staff, particularly those of agencies with formal budget authority, are often in the no-man's-land between institutional interests and the interests of the executive or legislative branches. Although they can ill afford to be more objective, of all the state-level agencies the staff of the coordinating agency may have to deal with the broadest range of policy alternatives.

Although no state agency staff has resources for analysis that equal those of the U. S. Congress, the Congressional Reference Service provides a good example of a staff serving primarily as an analytical resource for policymakers. The service is to provide "factual information, analysis of issues, alternatives to proposals, and evaluation of alternatives without either advocacy or partisan bias" (Beckman, 1975, p. 403). In addition to its policy analysis, the Congressional Reference Service is formally charged to provide for each House, Senate, and Joint Committee at the opening of a new Congress a list of subjects and policy areas which the committee might profitably analyze in depth; it submits to the appropriate committees of Congress

lists of programs and activities which are scheduled to terminate during that session of Congress; and it maintains continuous liaison with all congressional committees. At the state level, this function is usually carried out by a legislative reference service or counsel, but except for those states in which the legislative budget committees have no permanent staff, these counsel staffs have a relatively minor role in budgetary analysis.

The newly established Congressional Budget Office will attempt to provide neutral analyses of budgetary issues as the Congressional Reference Service does on policy matters. According to staff director Alice Rivlin, the Congressional Budget Office will not be taking positions or making recommendations; its function is to give Congress better information about budget choices. This it must do within the framework set by the requirement that on each April 1 the director of the Congressional Budget Office report to the Budget Committees on fiscal policy for the coming year with:

> a discussion of national budget priorities, including alternative ways of allocating budget authority and budget outlays for each fiscal year among major programs or functional categories, taking into account how such alternative allocations will meet major national needs and affect balanced growth and development of the United States. (Congressional Budget and Impoundment Act of 1974, 88 Stat. 297)

We found legislative budget staffs in the states to be taking somewhat more assertive roles in making recommendations than these formal statements would indicate of the staffs serving the U. S. Congress. Of course, the congressional staffs which are comparable to the legislative budget staffs in the states are those attached to the appropriation committees of the Congress. These staff are more numerous than the new staffs mentioned above, and they are, in addition, extremely aggressive in proposing budgetary recommendations. Even though many legislative staffers in the states thought of them-

selves as independent professionals, they are expected not only to avoid interjecting their own biases in order to retain the confidence of the policy officials they serve, but also to serve and justify the biases of the legislators for whom they work.

Without abandoning plans for eventual development of centralized data systems, some state budget participants have found that improved programmatic review is facilitated more by ad hoc and nonperiodic special analytic studies than by large-scale reorganization or comprehensive collection of data. Some of these special studies, such as cost studies or surveys of faculty workload, do become routine. The special analytic study can take advantage of bursts of energy and interest in a particular issue to mobilize a research effort, while attempts to design comprehensive information systems can take many years and still not include the data that may be needed for researching an issue of importance for budgetary planning. Frequently the very nature of these studies--for example, the necessity for analyzing a practice that is not being carried out currently--precludes the use of routinely available comprehensive data.

Program evaluation units in both the executive and legislative branches are also sources of planning information and expertise. Their evaluations, like the special analytic studies, depend to a great extent for their impact on timing. To influence the outcomes of the budget process, studies must be abstracted or condensed and channeled to those who review current budget submissions and make decisions about them. A few states have found it possible to sensitize budget examiners to the less routine and less structured conclusions of these evaluations and studies by encouraging mobility between budget review and program evaluation units. It is much more common, however, for the program evaluation unit to be somewhat isolated, and thus less able to function effectively as an adjunct to the budget process.

Two factors are paramount in reducing the effectiveness of these evaluation units, and they should be considered in establishing a role for them. The first of

these is the more easily overcome; for the latter, there may be no effective solution. Staff for these evaluation units predominantly have research backgrounds and as a rule, limited practical experience. In itself, this is not a shortcoming, for there must be some division of labor in the budget process. However, the staffs' heavy research orientation tends to result in analyses and documentation that are more appropriate for academic research. Not infrequently these staffers, like faculty at universities, are looking to their own academic discipline or profession as the arbiters of taste and style rather than to the state officials their analysis is intended to serve. Policy analysis and evaluation that can have an impact tend to be a lot more like investigative journalism than like academic research. They are likely to be synoptic and eclectic rather than highly focused and original. They must also be sensitive to the requirement that building support for policies is a crucial part of designing or improving them.

Secondly, the essence of evaluation is preference, and preferences differ both among individuals and among groups who have an interest in policy outcomes. Wildavsky (1972) captured the intractability of the evaluation problem when he concluded that evaluation and organization may be contradictory terms. Exhibit 11 below suggests some of the dimensions along which this contradiction exists. This pattern of contradiction makes it clear why organizational tension is a normal accompaniment of a properly conducted evaluation. One presumes that even Wildavsky, however, evaluates his graduate students as well as the work of assistant professors seeking tenure in his department. Evaluation may well be contradictory to organization, but evaluation is also an essential ingredient of choice.

Evaluation efforts can make the implications of past or pending choices more explicit by defining the problems to which public higher education addresses itself and noting how these problems are distributed. Evaluation also can identify who is helped by specific programs and how much, examine which programs do the most good, and probe how different kinds of social

Exhibit 11

CONTRADICTORY ELEMENTS IN ORGANIZATION AND EVALUATION

Dimensions	Organization	Evaluation
Basis for action	Consensus	Reason, analysis
Areas affected by organizational action	Programs, clienteles	Goals, objectives
Implications for structure	Stability	Change
Source of values	Participants	Philosophy, ideology
Desired staff values	Commitment	Skepticism

services can be produced most effectively (Rivlin, 1971). These analyses go well beyond the time and resources available for annual and biennial budgetary analysis, but it seems clear that formal evaluation should be one of the elements of the total process that determines which social programs are attempted, which are abandoned, and which are changed. However, no one should expect that evaluation alone will determine the choices which are made. The extent to which state agencies can induce institutions and systems toward self-evaluation may determine the eventual effectiveness of these evaluations.

Formal evaluation efforts by state agencies have only recently begun on any sizeable scale. Some have been ill-conceived and most have had relatively little impact. In general, however, one cannot say that this overall effort has been expensive in terms of the total effort expended. Although evaluation efforts may not have been a precision tool for correcting organizational deficiencies, they have served to bring to light administrative and procedural deficiencies. They have probably been substantially more efficient in their use of resources than have attempts to design comprehensive, centralized information systems.

The present study of state budgeting procedures found few instances in which outside management or economic consultants were used to provide expertise and analysis for the budget process, either directly or indirectly. Of course, technical budget review as practiced in most states neither requires nor lends itself to the use of outside personnel. Outside consultants, however, were used to design budget procedures in Michigan and Pennsylvania, to design the information and analysis procedures used at the state level in Illinois, to perform a management analysis of higher education in Virginia, and to design various information systems, such as an information system for the legislature in Washington and a community college information system in Illinois. There were undoubtedly other examples in the states we visited. The use of these specialized consultants may be effective in bringing greater analytical and conceptual resources to bear on a design problem because the total number of

state-level budget personnel is limited in all but the largest states, and the qualifications and special skills of agency personnel do not usually match those of the consultants. Aside from the quality of the work done, which is an obvious factor in implementation, use of outside consultants appears to have its greatest drawback in securing eventual implementation. All too often a product is "delivered" which, even if it meets the most critical objections, will not be implemented because the individuals who actually must use it were not sufficiently involved in its development. Consultants also are inclined to ignore organizational constraints on implementation, and they may spend considerable time learning facts already known by staffs.

Generally, the use of outside expertise for interjecting more analytical substance and expertise in the budget process at the state level is not as prevalent as it might be. We refer to the use of all kinds of outside sources, not just independent consultants. A major outside source of procedural assistance is the National Center for Higher Education Management Systems (NCHEMS) which has developed many of the tools and techniques on which state agencies depend. Through these "products" and through seminars and assistance with implementation, institutions and state agencies have been able to conserve their own resources and also achieve some of the commonality that has been desired by state and federal agencies.

Perhaps the largest source of specially qualified persons is the state agencies themselves, but aside from NCHEMS there seems to be no effective clearinghouse for identification of these sources. The National Association of College and Business Officers (NACUBO) and College and University Systems Exchange (CAUSE) provide that assistance to institutions and do not usually serve state agencies. To some degree, NCHEMS has also served such a role for the institutions, and is beginning to do the same for the state higher education agencies. But executive budget office staff and especially legislative budget staff do not have a formal means for effectively communicating about their professional interests, except at the very highest levels through the National Association

of State Budget Officers and the Council of State Governments. The Education Commission of the States (ECS) is beginning to bring these officials together and could serve an increasingly valuable role in the future. One major contribution it could make would be to establish a clearinghouse for exchange of state higher education studies and descriptions of analytic budgeting techniques. Legislative staffs are gradually developing linkages for exchange of these kinds of information through such organizations as the Legislative Program Evaluation Section of the Governmental Research Association.

LIMITATIONS IN THE APPLICATION OF ANALYSIS IN POLICY CHOICE

It may overstate the intent of research and analysis which supports higher education budgetary review and state-level planning to consider it as social science, yet the spirit motivating attempts to improve and increase these analytical efforts is the same as that behind attempts to increase the use of social science knowledge and methods in public policy administration. Therefore, we have examined the limitations on the use of centralized information and analysis systems in higher education budgeting by considering the utilization of social science methods more generally. In using the term analysis below, we mean the application of social science knowledge and techniques in the determination of public policy.

A number of factors may be responsible for the current distrust of science and its application in public policy formulation; one certainly is the concern that "hard" science and technology are generating effects beyond our control, and this concern has undoubtedly carried over to social science. If anything, this is a countertrend to the more widely spread and overly optimistic expectations of both those who make policy and those who administer and analyze it. Millikan (1963) has cogently summarized a number of misconceptions from both the action-oriented side (which we shall call the policymaker or policy administrator) and the research side (which we shall call the analyst). A 1973-1974

survey made by the Institute for Social Research of over 200 top-level executive branch political appointees and civil servants on their use of social science knowledge suggests that these misconceptions are still widely held (Caplan, Morrison, & Stambaugh, 1975). Quoting Millikan (1963):

> [The policymaker] frequently has an exaggerated notion of the degree to which the solution of his problems can be effected by the collection of additional factual information. . . . He tends to expect prediction in situations in which this is clearly beyond the capabilities of present day social science . . . he too easily assumes that the conclusions of a research project will assist him when the important factor is actually the process of analysis underlying those conclusions. (p. 170)

The analyst likewise tends to have an exaggerated faith in the division of labor between actions and analysis. He also underestimates the intellectual or substantive content of the policymaking process because those who administer policy usually do not articulate the interpretation of their judgments and courses of action in the terminology of social science. Consequently, the analyst assumes that decisionmaking is overly intuitive. The ability of most policymakers to define the conceptual framework in which they state their operational problems also is overestimated.

Protagonists for analysis have tended to ignore the fundamental conflict in political problem solving which Lindblom (1968) identified as being between the ideas that stress, on the one hand, man's fallibility and the consequent need for liberal democratic political institutions, and on the other, man's competence, his potential for theoretical formulations sufficient to guide social reconstruction, and the consequent acceptability of authoritarian leadership in the hands of the competent. Primed with the derivations of theoretical welfare economics, which Boulding has called one of the most

barren excursions in the history of economic theory, analysts completely disregarded the separations between science and moral and political philosophy. The inability of science to cope with the hierarchy of social and political ends was thought to have been overcome, and as a consequence, the advocates of managing our public affairs with mathematical models and scientific analysis promised too much. (See Moynihan, 1973, for a description of one man's conversion and subsequent recantation.)

At present, the prospect of raising the analytical content of the public budgeting process is greatly restricted by the failures associated with PPB and other budgetary procedures which have attempted similar reforms. After these excesses, however, the healthy skepticism which undoubtedly exists may provide an environment for more effective reforms.

The introduction of analytical procedures into the budget process has been critiqued so thoroughly that a review here is both unnecessary and impossible. (See especially Merewitz and Soznick, 1971, and the publications referred to at the beginning of the previous chapter.) However, to emphasize considerations revealed by our study we shall mention five important problems.

1. Because good analysis cannot be reduced to procedural routines, it therefore will always encounter frictions with the budget process which must precede it and be completed according to a tight time schedule. Thus, a crucial problem for management is devising arrangements for freeing analysis from the routine of budget review, and at the same time providing channels for the consequences of staff analysis and evaluation to have an effect on budgetary and planning outcomes. The difficulty this introduces is illustrated by the distinction between algorithmic and heuristic problem solving. Algorithmic problem solving involves the solution of problems with a fixed structure, an identifiable set of variables and parameters, and a completely specified set of decision rules. Budgetary planning and review takes place in a context of such time constraints and resources that most participants would undoubtedly find

it desirable if this process could be reduced to an algorithm. In practice, use of budgetary formulas in a rigid sense comes as close as any budgetary procedure to such an algorithm. In fact, budgetary procedures make various attempts at simplification by reducing certain actions to algorithms in order to accomplish a difficult and complex task in a limited time span. Introduction of analysis, which cannot be predefined or specified, makes the budget process more heuristic in that it serves only to specify guidelines and provisional methods for coping with a dynamically shifting problem structure. Thus, analysis may make budgetary problems more intractable in the limited time available to solve them.

2. It has been suggested that introducing analytical procedures which make assumptions, procedures, and consequences more explicit raises the likelihood of conflict. Because the budget process must result in unambiguous choices on levels of funding, it is argued that it must be from beginning to end a process which builds consensus. The lack of fuzziness in a final dollar appropriation may be moderated by a fuzziness in the specification of assumptions, procedures, and consequences.

3. Analysis may unwittingly introduce certain biases in its application of explicitly logical methods which are predominantly quantitative. Emphasizing the quantitative may ultimately result in more significant and important qualitative factors being ignored. Furthermore, one of the primary strengths of analysis, the substitution of reasoning for experience through simulation and theoretical explanation, implies that even if decisions are not made, they can at least be considered more remotely from operating responsibility. Thus, analysis may foster centralization and control. By insisting that the world is too complicated for common sense alone to resolve its problems, analysis sets itself in conflict with democratic decision rules which assume that no one can know enough, and that consensus or majority decision are the only acceptable mechanisms for choice.

4. The bargaining context of the budget process also raises doubts about the efficacy of information

and analysis which would not arise in a simpler single decisionmaker context. The theory of games treats a subclass of games known as nonzero-sum, noncooperative games of which the game of the prisoner's dilemma is a famous example. Dror (1968) offers this game as an example of a bargaining situation in which a logical or rational problem solving approach leads to results which would be inferior to intuitive or "extra-rational" methods. The interpretation of this game situation given by Luce and Raiffa (1957) is provided in Appendix D. We have not been able to draw a valid budgeting application of this game, but the recent experience of the State University System of Florida with the exploitation of budgetary formulas by two of its campuses comes to mind (see Van Dyne, 1974). Clearly, there are cooperative (free exchange of information) game situations in which the disclosure of information (on preferences, activities, etc.) would be irrational, that is, would not serve the interests of the participants in a bargaining situation.

5. As noted above, difficulties may arise in the use of analysis because of the overriding attention given to the results by both the policymaker and the analyst. But what often happens is that results are ignored where they are counterintuitive, and are accepted uncritically where they are consistent with intuition. If results seem reasonable in the light of commonsense, they are often felt to be intuitively obvious by a policymaker, and analysis is considered a waste of time. The survey undertaken by the Institute for Social Research (Caplan et al., 1975), and mentioned earlier in this chapter, concerned the use of results from program evaluation, survey research, demographic research, social statistics, and field experimentation, which may go beyond much of the analysis that comes to bear on problems of budgetary analysis. Nonetheless, the conclusion of that study, indicating a preoccupation with the results of analysis, would undoubtedly be confirmed in a similar study of state budget officials.

With all of these problems in introducing analysis into the decision process and its alleged detrimental effects, one wonders why the budgetary process continues

to involve any analysis. Despite the warnings, however, there is hardly any indication that present-day budgeting and planning processes involve too much analysis, although there are some indications that the current burden of information for both federal and state agencies that must be carried by staff and administrative channels is excessive. What appears to be developing is a sense of analytical due process, analogous to administrative due process, that there is a minimal level of logical and explicit analysis that should be a factor in legitimately reached public sector decisions. While this presents a potential reporting problem if it is the upward flow of post hoc information that is emphasized, the notion that improved decisionmaking would be served by a minimal level of information and analysis does not seem unreasonable. Filtering and biasing of the upward flow of information or simply swamping those at higher levels with more information than they can handle limits the effectiveness of upward reporting systems.

If many of the expectations for analysis are exaggerated by its proponents, what then are some more reasonable expectations? First of all, analysis is likely to achieve more tangible results in terms of the process of public policymaking than in relation to specific results. On identifying organizational objectives, Hitch (1961) commented:

> So what does the analyst do? If he cannot find anyone to give him acceptable objectives, where does he obtain them? The only answer I have is that learning about objectives is one of the chief objects of this kind of analysis. . . . We have never undertaken a major systems study at RAND in which we were able to define satisfactory objectives at the beginning of the study. (p. 49)

In this respect, analysis does not give answers to policy questions, but it may contribute to their formulation.

Millikan (1963) has suggested that the task of social science is to provide the substance of argument through

extending the policymakers' capacity for judgment. Agency officials may lack the time for analysis themselves, but through their use of staff a greater range of analytical substance can be brought to bear on issues to raise the level of the policy dialogue. Further, policy choices are often surrounded by clusters of intuitively obvious, but partially conflicting statements. Sound analysis can determine which of the contradictory, but intuitively obvious conclusions about a situation is in fact true and under what circumstances it may be expected to hold. This application of analysis may appear somewhat restricted in comparison with the role given it by Utopian social engineers and planners. But it is a far more activist role than that allowed for by those who would restrict analysis (and social science) to the mere interpretation of events because they believe that social development is unfolding according to various immutable patterns and trends. Not forgetting that our primary concern is an appropriate role for budgeting information and analysis systems, we should note that our discussion is influenced by the philosophical criticisms of Popper (1962), who argued:

> Only a minority of social institutions are consciously designed, while the vast majority have just "grown," as the undesigned results of human actions. . . . The main task of the social sciences . . . is the task of analyzing the unintended social repercussions of intentional human actions. (pp. 93, 95)

Various observers have pointed out that organizations do not learn well from experience. This is attributable, in part, to the weakness of the intelligence function, the fact that organizational memory is often weak. We have noted that the political process often thrives on this dull organizational memory because of the necessity to produce consensus, and may oppose changes that would sharpen memory. In the special case of state budget agencies, where the turnover of analytical staff is particularly high, this memory function may be improved by a greater capacity to store and analyze information.

The pluralist or checks and balances model, which describes most accurately the process employed at all governmental policy levels in the United States, emphasizes that the process for decision is paramount. If that process is legitimate, then the outcomes of the process are acceptable. But as Schick (1969) has pointed out, there are imbalances in power in political markets, just as there are in economic markets for goods and services. Analysis, hard logic, and the scrutiny of implicit assumptions, processes, and consequences are needed as a "check" on the political process. As in economic markets, political participants try to gain comparative advantage over the allocation of political goods and services. If facts are ignored or interested parties are excluded, mere agreement (consensus) is not in itself an adequate criterion for evaluating the outcome. This is not to suggest that reason and analysis become the final arbiter of public choice, but that reason and analysis have a legitimate supporting role to play in determining these choices.

As for the specifics of budgeting, it is in the costing and evaluating functions that analysis has the greatest role to play. Rivlin (1971) posed four questions that anyone making decisions on social action programs should answer:

1. How do we define social problems, and how are they distributed?

2. Who would be helped by specific social action programs, how much, and at what cost?

3. How can particular kinds of social services be produced more effectively?

4. How do the benefits of different kinds of programs compare?

The budget process does not explicitly address all of these questions for all state programs every cycle, but implicitly and in varying levels of detail it does answer these questions either with analysis or through the political process. In view of our earlier conclusions

about the importance of methods versus results, we are interested in analysis as a method for addressing these questions in the context of higher education. It must be noted that only with respect to the first two questions above has much progress been made. Although the third question appears tractable, Rivlin observed that few attempts have been made to organize social services in such a way as to address this question. No analytical method is available for addressing the fourth question. With respect to public higher education, analysis has provided a fairly sound basis for looking at educational problems and their distribution; it has provided numerous approaches to costing, but only a very limited indication of benefits, either private or public; and as is true for most other social services, it has contributed very little toward evaluating alternative means of providing higher education.

Although we shall not offer an agenda for analysis because that depends very much on the particular issues and concerns in a state, two issues relating to budget information could be illuminated by analytical effort. The first of these is the development of alternative models for budgetary and programmatic review. Currently, the field is almost totally dominated by the "production" model in which, for budgetary purposes, virtually every social service agency is treated as a production process consisting of a set of inputs, a technology of production, and a set of outputs. Many of the difficulties in developing adequate and useful information systems are related to difficulties in applying this model to organizational processes which are not truly production processes, since their outputs cannot be practically specified. This model is, of course, very attractive because it meshes well with the costing function of budgeting, and because it provides a connection with the status quo, so that incremental changes are encompassed. Because it can be used to answer crucial costing questions, it is unlikely that it will be completely supplanted in the budget process. In a no-growth environment, however, simple versions of the production model are inadequate. It should be the task of analysis to explore the nonlinear features of university financing as they relate to the critical mass

characteristics of departments, size of student body and faculty, and breadth of course offerings. This analysis would be related to an investigation of the simple ratios, such as student/faculty ratios and average-cost ratios, which are used in budgeting without any valid information about the operational implications of funding determined in this way. This requires analysis of the kind carried out by Carlson (1972), which developed more suitable indices of the cost and production behavior of institutions. While this kind of analysis cannot, like formulas, become a part of the budget process, its results and conclusions should at least inform the budget process. Because of its ability to examine both intended and unintended consequences of proposed changes, analysis can explore alternatives in funding arrangements, such as performance contracts and student vouchers.

Further, analysis can be effective in developing a theoretical base which supports data structures and their educational or social indicators. The success of the national economic data collection for policy and research use has been partially due to the existence of theories of the macro-economy which suggested, first of all, the structure and relationships between variables, and secondly, determined which of the many variables would be useful economic indicators.

Ultimately, we are faced with the question posed by Miller (1964) in his discussion of formula methods of budgeting which, before the advent of PPB, must have represented a pinnacle of achievement in incorporating analysis into the budget process. Is the recognition and acceptance of the value content in the final budget choices incompatible with the advocacy of a rational procedure for considering them?

If by rational we mean a procedure governed by the principles of science, which gives us criteria for ascertaining facts or knowledge, then the answer must be yes, for determining the priority of social values and the proper course for social action is not just a problem of finding facts. However, if rational refers to distinct sets of technolgoical, economic, legal, and sociopolitical

principles, as Diesing (1962) has argued, then this incompatibility is removed, albeit by definition. Each of these sets of principles has its own concepts, and most importantly, its own problem-defining and problem solving methods which may interact with each other from one extreme to the other as values influence facts and facts influence values. Although it is far better to recongize the mutual dependence of fact and value than to separate them, the task for those who try to apply these sets of principles is to recognize when each set should be dominant. For this reason, the best educational policy or budget analyst is likely to be a teacher-economist-social philosopher.

References

Anthony, R. N. *Planning and control systems: A framework for analysis.* Cambridge: Graduate School of Business Administration, Harvard University Press, 1965.

Ashby, E. *Any person, any study.* New York: McGraw-Hill, 1971.

Bailey, J. J., & O'Connor, R. J. Operationalizing incrementalism: Measuring the muddles. *Public Administration Review,* January/February 1975, *35*(1), 60-66.

Bailey, S. K. A comparison of the university with a government bureau. In J. A. Perkins (Ed.), *The university as an organization.* New York: McGraw-Hill, 1973.

Balutis, A. P., & Butler, D. K. (Eds.). *Political pursestrings: The role of the legislature in the budgetary process.* New York: Halsted Press, 1975.

Balutis, A. P. The budgetary process in New York State: The role of the legislative staff. In A. P. Balutis, & D. K. Butler (Eds.), *Political pursestrings: The role of the legislature in the budgetary process.* New York: Halsted Press, 1975.

Barak, R. J. *State-level management information systems for higher education: A survey summary.* Unpublished report, Iowa State Board of Regents, April 1975.

Beckman, N. Use of a staff agency by the Congress: The congressional reference service. *Bureaucrat*, January 1975, *3*(4), 401-428.

Berdahl, R. O. *Statewide coordination of higher education*. Washington, D.C.: American Council on Education, 1971.

Bogard, L. Management in institutions of higher education. In A. A. Mood, C. Bell, L. Bogard, H. Brownlee, & J. McCloskey, *Papers on efficiency in the management of higher education*. Berkeley: Carnegie Commission on Higher Education, 1972.

Boulding, K. E. The management of decline. *Change*, June 1975, *7*(5), 8-9.

Bowen, F. M., & Glenny, L. A. *State budgeting for higher education: State fiscal stringency and public higher education*. Berkeley: Center for Research and Development in Higher Education, University of California, 1976.

Bowen, F. M., Ruyle, J., & Glenny, L. A. *State Budgeting for higher education: Budget processes in the 50 states*. Berkeley: Center for Research and Development in Higher Education, University of California, in preparation.

Braybrooke, D., & Lindblom, C. E. *A strategy of decision*. New York: The Free Press, 1963.

Butler, D. K. The legislative budget in Texas. In A. P. Balutis, & D. K. Butler (Eds.), *Political purse-strings: The role of the legislature in the budgetary process*. New York: Halsted Press, 1975.

Bureau of the Budget. Bulletin No. 68-2, July 18, 1967.

Burkhead, J. *Government budgeting*. New York: John Wiley, 1956.

Caplan, N., Morrison, A., & Stambaugh, R. J. *The use of social science knowledge in policy decisions at the*

national level. Ann Arbor: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, 1975.

Carlson, D. E. *The production and cost behavior of higher education institutions* (Ford Foundation Program for Research in University Administration, Paper P-36). Berkeley: University of California, December 1972.

Carnegie Commission on Higher Education. *Higher education: Who pays? Who benefits? Who should pay?* New York: McGraw-Hill, 1973.

Chase, S. B., Jr. *Problems in public expenditure analysis*. Washington, D.C.: The Brookings Institution, 1967.

Cheit, E. F. The management systems challenge: How to be academic though systematic. In J. F. Hughes (Ed.), *Education and the state*. Washington, D.C.: American Council on Education, 1975.

Citizens Conference on State Legislatures. *The sometime governments*. Kansas City, Mo.: Author, 1971.

Cohen, M. D., March, J. G., & Olsen, J. P. A garbage can model of organizational choice. *Administrative Science QUarterly*, March 1972, *17*(1), 1-25.

Collier, D. J. *Higher education finance manual* (Technical Report 69). Boulder, Co.: National Center for Higher Education Management Systems at WICHE, 1975.

Commonwealth of Pennsylvania, Budget Instructions for Colleges and Universities, FY 1974-1975, Appendix B.

Corbally, J. E., Jr. The impact of MIS on and within a major institution and institutional system. In *Information impact-collision with tradition* (Report No. 49). Denver: Education Commission of the States, May 1974.

Council of State Governments. *Higher education in the forty-eight states*. Chicago: Author, 1952.

Crecine, J. P. *Governmental problem-solving: A computer simulation of municipal budgeting*. Chicago: Rand McNally, 1969.

Davis, O., Dempster, M. A. H., & Wildavsky, A. On the process of budgeting: Am empirical study of congressional appropriation. *Papers on Non-Market Decision Making*, 1966, 63-132.

Dearden, J. MIS is a mirage. *Harvard Business Review*, January/February 1972, *50*(1), 90-99.

Diesing, P. *Reason in society: Five types of decisions and their social conditions*. Urbana: University of Illinois Press, 1962.

Dippel, G., & House, W. C. *Information systems*. Glenview, Ill.: Scott, Foresman, 1973.

Downs, A. A realistic look at the final payoffs from urban data systems. *Public Administration Review*, September/October 1967, *27*(5), 204-210.

Dror, Y. *Public policy reexamined*. San Francisco: Chandler, 1968.

Dye, T. R. *Politics in states and communities* (2nd ed.). Englewood Cliffs, N.J.: Prentice-Hall, 1973.

Dyer, J. S. The use of PPBS in a public system of higher education: Is it cost-effective? *Academy of Management Journal*, September 1970, *13*(3), 285-299.

Ellul, J. *The technological society*. New York: Knopf, 1965.

Fenno, R. F., Jr. *The power of the purse*. Boston: Little, Brown, 1966.

Fincher, C. On the rational solution of dominant issues in higher education. *Journal of Higher Education*, November/December 1975, *35*(6), 625-628.

Gerwin, D. *Budgeting public funds: The decision process in an urban school district.* Madison: University of Wisconsin Press, 1969.

Glenny, L. A. *Autonomy of public colleges.* New York: McGraw-Hill, 1959.

Glenny, L. A. *State budgeting for higher education: Interagency conflict and consensus.* Berkeley: Center for Research and Development in Higher Education, University of California, 1976.

Glenny, L. A., Bowen, F., Meisinger, R., Morgan, A., Purves, R., & Schmidtlein, F. *State budgeting for higher education: Data digest.* Berkeley: Center for Research and Development in Higher Education, University of California, 1975.

Gross, B. M. The new systems budgeting. *Public Administration Review,* March/April 1969, *29*(2), 113-137.

Gross, F. M. *A comparative analysis of the existing budget formulas used for justifying budget requests or allocating funds for the operating expenses of state-supported colleges and universities.* Unpublished doctoral dissertation, University of Tennessee, 1973.

Gulko, W. W. *Program classification structure* (Technical Report 27). Boulder, Co.: National Center for Higher Education Management Systems at WICHE, 1972.

Highet, G. The need to "make it new." *Chronicle of Higher Education, June 21, 1976, 40.*

Hitch, C. J. On the choice of objectives in systems studies. In D. P. Eckman (Ed.), Systems: Research and design (Proceedings of the First Systems Symposium at the Case Institute of Technology). New York: John Wiley, 1961.

Howard, S. K. *Changing state budgeting.* Lexington, Ky.: Council of State Governments, 1973.

Huff, R. A., & Chandler, M. O. *A taxonomy of instructional programs in higher education* (National Center for Educational Statistics). Washington, D.C.: U.S. Government Printing Office, 1970.

Jernberg, J. E. Information change and congressional behavior: A caveat for PPB reformers. *Journal of Politics*, August 1969, *33*(3), 722-740.

Kent, J. D. Legislative fiscal staffing in Illinois. In A. P. Balutis, & D. K. Butler (Eds.), *Political pursestrings: The role of the legislature in the budgetary process*. New York: Halsted Press, 1975.

Kingdon, J. W. *Congressmen's voting decisions*. New York: Harper & Row, 1973.

Lee, R. D., Jr., & Johnson, R. W. *Public budgeting systems*. Baltimore: University Park Press, 1973.

Lindblom, C. E. *The policy-making process*. Englewood Cliffs, N.J.: Prentice-Hall, 1968.

Luce, R. D., & Raiffa, H. *Games and decisions*. New York: John Wiley, 1957.

Lyden, F. J. The budget cycle as a basis for decision-making in higher education. *Planning for Higher Education*, October 1975, *4*(5).

Lyden, F. J., & Miller, E. G. *Planning programming budgeting: A systems approach to management*. Chicago: Markham, 1968.

McCoy, M., Cherin, E., Makowski, D., & Weldon, K. *State and local financial support of higher education: A framework for interstate comparisons 1973-1974*. Boulder, Co.: National Center for Higher Education Management Systems at WICHE, 1976.

Meisinger, R. J., Jr. *State budgeting for higher education: The uses of formulas*. Berkeley: Center for Research and Development in Higher Education, University of California, 1976.

Merewitz, L., & Sosnick, S. H. *The budget's new clothes: A critique of PPB and benefit-cost analysis.* Chicago: Markham, 1971.

Miller, J. L., Jr. *State budgeting for higher education: The use of formulas and cost analyses.* Ann Arbor: Institute of Public Administration, University of Michigan, 1964.

Millikan, M. F. Inquiry and policy: The relation of knowledge to action. In D. Lerner (Ed.), *The human meaning of the social sciences.* New York: Meridian, 1963.

Mitroff, I. I., & Pondy, L. R. On the organization of inquiry: A comparison of some radically different approaches to policy analysis. *Public Administration Review,* September/October 1974, *34*(5), 471-479.

Moos, M., & Rourke, F. *The campus and the state.* Baltimore: Johns Hopkins Press, 1959.

Moynihan, D. P. *Coping: On the practice of government.* New York: Random House, 1973.

National Association of College and University Business Officers. *College and university business administration* (2nd ed.). Washington, D.C.: Author, 1968.

National Association of College and University Business Officers. *College and university business administration* (3rd ed.). Washington, D.C.: Author, 1974.

National Commission on the Financing of Postsecondary Education. *Financing postsecondary education in the United States.* Washington, D.C.: U. S. Government Printing Office, December 1973.

Niskanen, W. A. Why new methods of budgetary choices? Administrative aspects. *Public Administration Review,* March/April 1972, 155-161.

Popper, K. *The open society and its enemies* (Vol. 2). Princeton: Princeton University Press, 1962.

Pyhrr, P. A. *Zero-base budgeting*. New York: John Wiley, 1973.

Rivlin, A. M. *Systematic thinking for social action*. Washington, D.C.: The Brookings Institution, 1971.

Ruyle, J., & Glenny, L. A. *State budgeting for higher education: Trends in state revenue appropriations from 1968-1975*. Berkeley: Center for Research and Development in Higher Education, University of California, in preparation.

Schick, A. *Budget innovation in the states*. Washington, D.C.: The Brookings Institution, 1971.

Schick, A. The road to PPB: The stages of budget reform. *Public Administration Review*, December 1966, *26*(4), 243-258.

Schick, A. Systems politics and systems budgeting. *Public Administration Review*, March/April 1969, *29*(2), 137-151.

Schmidtlein, F. A. *Decison processes and their structural implications: A case study of library planning at the University of California*. Unpublished doctoral dissertation, University of California, Berkeley.

Schmidtlein, F. A., & Glenny, L. A. *State budgeting for higher education: The political economy of the process*. Berkeley: Center for Research and Development in Higher Education, University of California, 1976.

Schultze, C. L. *The politics and economics of public spending*. Washington, D.C.: The Brookings Institution, 1968.

Silverman, E. B., & Gatti, F. C., Jr. PPB on the state level: The case of Pennsylvania. *The Bureaucrat*, July 1975, *4*(2), 117-146.

Simon, H., Smithburg, D., & Thompson, V. *Public administration.* New York: Knopf, 1970.

State of Connecticut. Department of Finance and Control. 1974.

State of Hawaii. The multi-year program and financial plan for the period 1974-1980. Submitted to the 7th State Legislature, December 1973.

Steiner, P. O. Public expenditure budgeting. In *The economics of public finance.* Washington, D.C.: The Brookings Institution, 1974.

U.S. Bureau of the Budget. Bulletin No. 68-2, July 18, 1967. Reprinted in Lyden & Miller (1968), pp. 440-441.

U.S. Bureau of the Budget. Circular No. A-12, July 22, 1960.

University of Wisconsin System. *1973-75 biennial budget documentation,* Book V, U.W. System Biennial Budget Request and Decision Item Narrative, August 1972.

Van Dyne, L. Tallahassee hassle: A scholar's explosive memo. *The Chronicle of Higher Education,* July 1974, *8*(37), 10-11.

Weiss, S. D. Management information systems. In C. A. Cuadra & A. W. Like (Eds.), *Annual review of information science and technology* (Vol. 5). Chicago: Encyclopedia Britannica, 1970.

Wildavsky, A. *The politics of the budgetary process.* Boston: Little, Brown, 1964.

Wildavsky, A. The political economy of efficiency: Cost-benefit analysis, systems analysis, and program budgeting. *Public Administration Review,* December 1966, *26*(4), 292-310.

Wildavsky, A. Rescuing policy analysis from PPBS. *Public Administration Review,* March/April 1969, *29*(2), 189-202.

Wildavsky, A. The self-evaluating organization. *Public Administration Review*, September/October 1972, *32*(5), 509-520.

Williamson, O. E. A rational theory of the federal budgeting process. *Papers on Non-Market Decision-Making*, 1967, *2*, 71-89.

Wolin, S. S. *Politics and vision*. Boston: Little, Brown, 1960.

General Bibliography

American Institute of Certified Public Accountants. *Audits of colleges and universities*. New York: Author, 1973.

Anthony, R. N., & Herzlinger, R. E. *Management control in nonprofit organizations*. Homewood, Ill.: Richard D. Irwin, 1975.

Blumenthal, S. C. *Management information systems: A framework for planning and development*. Englewood Cliffs, N.J.: Prentice-Hall, 1969.

Brewer, G. D. *Politicians, bureaucrats, and consultants*. New York: Basic Books, 1973.

Chartrand, R. L., Janda, K., & Hugo, M. (Eds.). *Information support, program budgeting, and the Congress*. New York: Spartan Books, 1968.

Davis, G. B. *Management information systems: Conceptual foundations, structure, and development*. New York: McGraw-Hill, 1974.

Ebert, R. J., & Mitchell, T. R. *Organizational decision processes*. New York: Crane, Russak, 1975.

Galbraith, J. *Designing complex organizations*. Reading, Mass.: Addison-Wesley, 1973.

Hill, M. J. *The sociology of public administration.* New York: Crane, Russak, 1972.

Hussain, K. M. *Development of information systems for education.* Englewood Cliffs, N.J.: Prentice-Hall, 1973.

Johnson, C. B., & Katzenmeyer, W. G. (Eds.) *Management information systems in higher education: The state of the art.* Durham, N.C.: Duke University Press, 1969.

Lyden, F. J., & Miller, E. G. (Eds.). *Planning programming budgeting: A systems approach to management* (2nd ed.). Chicago: Markham, 1972.

National Research Council, Assembly of Behavioral and Social Sciences, Committee on Department of Labor Manpower Research and Development. *Knowledge and policy in manpower: A study of the manpower research and development program in the department of labor.* Washington, D.C.: National Academy of Sciences, 1975.

Niskanen, W. A. *Structural reform of the federal budget process.* (Domestic Affairs Study No. 12). Washington, D.C.: American Enterprise Institute for Public Policy Research, April 1973.

Rosenthal, A. *Legislative performance in the states.* New York: The Free Press, 1974.

Toombs, W. *Productivity: Burden of success* (ERIC/Higher Education Research Report No. 2). Washington, D.C.: American Association for Higher Education, 1973.

Weidenbaum, M. L., Larkins, D., & Marcus, P. N. *Matching needs and resources.* Washington, D.C.: American Enterprise Institute for Public Policy Research, March 1973.

Wildavsky, A. Review of Brewer's politicians, bureaucrats, and the consultant. *Science,* 1973, *28,* 1335-1338.

Wilensky, H. *Organizational intelligence.* New York: Basic Books, 1967.

APPENDIX A-1

NACUBO Current Funds Expenditures Accounts, 1968

EDUCATIONAL AND GENERAL

INSTRUCTION AND DEPARTMENTAL RESEARCH
Accounts by divisions, schools, colleges, and departments of instruction, following the administrative organization of the institution.

ORGANIZED ACTIVITIES RELATED TO EDUCATIONAL DEPARTMENTS
Accounts for each such activity for which revenue accounts have been established.

SPONSORED RESEARCH
Accounts by individual projects, classified by organizational units.

OTHER SEPARATELY BUDGETED RESEARCH
Accounts by individual projects, classified by organizational units.

OTHER SPONSORED PROGRAMS
Accounts by individual projects, classified by organizational units.

EXTENSION AND PUBLIC SERVICE
Accounts for each organizational unit in this category, such as:
Agricultural Extension Activities
Continuing Education
Departmental Research Bureaus
Public Lectures and Concerts

Source: National Association of College and University Business Officers (2nd ed.), 1968.

LIBRARIES

Accounts for all libraries, both central as well as departmental.

STUDENT SERVICES

Accounts for all organizational units, such as:

Registrar
Dean of Students
Director of Admissions
Financial Aid Officer
Health or Infirmary Services--*unless classified as an Auxiliary Enterprise*

OPERATION AND MAINTENANCE OF PHYSICAL PLANT

Accounts for all organizational units and functions, such as:

Administration
Custodial Services
Maintenance of Buildings
Maintenance of Grounds
Utilities
Police and Watchmen
Trucking Services
Fire Protection
Motor Pool and Transportation Services--*unless classified as a Service Department*
Property Insurance

GENERAL ADMINISTRATION--detailed as needed; for example:

Governing Board
President
Chief Academic Officer
Chief Business Officer
Investment Officer
Legal Counsel

STAFF BENEFITS--detailed as needed; for example:

Retirement Contract Premiums
Group Life Insurance Premiums
Health and Medical Insurance Premiums
Workmen's Compensation Insurance

GENERAL INSTITUTIONAL EXPENSE--detailed as needed; for example:

Alumni Office
Auditing
Catalogues and Bulletins
Commencements
Convocations
Development Office
General Insurance--*other than Property Insurance*
Interest on Current Funds Loans
Legal Fees
Memberships
Publications
Public Relations
Telephone and Telegraph--*unless charged to departmental budgets*

STUDENT AID

Accounts as needed and desired for undergraduate and graduate scholarships, fellowships, grants-in-aid, prizes, and awards.

Tuition remissions--*unless classified as scholarships or fellowships*

Accounts may be set up for instructional divisions and departments, such as:

School of Medicine
Department of Physics

AUXILIARY ENTERPRISES

Accounts as needed and desired for the same enterprises included in the Current Funds Revenues accounts.

SERVICE DEPARTMENTS

Nominal, or Interim, accounts for all organizational units classified in this category. These accounts should be closed out at the end of each fiscal year.

APPENDIX A-2

NACUBO Current Funds Expenditures Accounts, 1974

EDUCATIONAL AND GENERAL

INSTRUCTION

Accounts by divisions, schools, colleges, and departments of instruction following the administrative organization of the institution. The four functional subcategories are:

- General academic instruction
- Occupational and vocational instruction
- Special session instruction
- Community education

RESEARCH

Accounts by individual projects, classified by organizational units. The two functional subcategories are:

- Institutes and research centers
- Individual or project research

PUBLIC SERVICE

Accounts by activities, classified by type of activity, such as:

- Community Service
- Conferences and Institutes
- Cooperative Extension Service
- Public Lectures
- Radio
- Television

From *College and University Business Administration*, Third Edition (Washington, D. C., 1974), by permission of the National Association of College and University Business Officers, pp. 212-214.

ACADEMIC SUPPORT

Accounts by activities, classified by type of activity, such as:

- Academic Administration and Personnel Development
- Audiovisual Services
- Computing support *(excluding administrative data processing), unless distributed to using activities*
- Course and Curriculum Development
- Demonstration Schools
- Libraries
- Museums and Galleries

STUDENT SERVICES

Accounts by activities, classified by type of activity, such as:

- Admissions Office
- Counseling and Career Guidance
- Cultural Events
- Dean of Students
- Financial Aid Administration
- Health and Infirmary Services *if not an integral part of a hospital nor operated as an essentially self-supporting operation*
- Intramural Athletics
- Intercollegiate Athletics *if operated as an integral part of department of physical education and not essentially self-supporting*
- Registrar
- Student Organizations
- Remedial Instruction

INSTITUTIONAL SUPPORT--*detailed as needed, for example:*

- Governing Board
- Chief Executive Office
- Chief Academic Office
- Chief Business Office
- Investment Office
- Legal Counsel
- Administrative Data Processing
- Alumni Office
- Auditing, internal and external
- Safety
- Security

Catalogues and Bulletins
Commencements
Convocations
Development Office
Employee Personnel and Records
Fund Raising
General Insurance *other than Property Insurance*
Interest on Current Funds Loans
Legal Fees
Memberships
Printing
Provision for Doubtful Accounts and Notes
Publications
Public Relations
Purchasing
Service Departments
There should be interim accounts for all organizational units classified in this category; these accounts should be closed out at the end of each fiscal year.
Space Management
Telephone and Telegraph *unless charged to departmental budgets*
Transportation *including motor pool, unless operated as a service department*

OPERATION AND MAINTENANCE OF PLANT
Accounts for all organizational units and functions, such as:
Administration
Custodial Services
Maintenance of Buildings
Maintenance of Grounds
Utilities
Trucking Services
Fire Protection
Property Insurance

SCHOLARSHIPS AND FELLOWSHIPS
Accounts as needed and desired for scholarships, fellowships, grants-in-aid, trainee stipends, prizes, and awards.
Tuition and Fee Remissions *unless properly classified as staff benefit expenditures Accounts may be set up*

for instructional divisions and departments, such as:
School of Medicine
Department of Physics

AUXILIARY ENTERPRISES, HOSPITALS, AND INDEPENDENT OPERATIONS

AUXILIARY ENTERPRISES

Accounts as needed and desired for such enterprises as included in the Current Funds Revenues accounts. Provision should be made for identification of mandatory and nonmandatory transfers--to and from--by significant subcategories.

HOSPITALS

Accounts as needed and desired. Provision should be made for identification of mandatory and nonmandatory transfers--to and from--by significant subcategories.

INDEPENDENT OPERATIONS

Accounts as needed and desired for organizational units.
Provision should be made for identification of mandatory and nonmandatory transfers--to and from--by significant subcategories.

APPENDIX B

HEGIS Taxonomy of Instructional Programs in Higher Education

0100 AGRICULTURE AND NATURAL RESOURCES

- 0101 Agriculture, General
- 0102 Agronomy (Field Crops, and Crop Management)
- 0103 Soils Science (Management and Conservation)
- 0104 Animal Science (Husbandry)
- 0105 Dairy Science (Husbandry)
- 0106 Poultry Science
- 0107 Fish, Game, and Wildlife Management
- 0108 Horticulture (Fruit and Vegetable Production)
- 0109 Ornamental Horticulture (Floriculture, Nursery Science)
- 0110 Agricultural and Farm Management
- 0111 Agricultural Economics
- 0112 Agricultural Business
- 0113 Food Science and Technology
- 0114 Forestry
- 0115 Natural Resources Management
- 0116 Agriculture and Forestry Technologies
- 0117 Range Mangagement
- 0199 Other, Specify

0200 ARCHITECTURE AND ENVIRONMENTAL DESIGN

- 0201 Environmental Design, General
- 0202 Architecture
- 0203 Interior Design
- 0204 Landscape Architecture

Source: Huff, R. A., & Chandler, M. O., 1970.

0205 Urban Architecture
0206 City, Community, and Regional Planning
0299 Other, Specify

0300 AREA STUDIES

0301 Asian Studies, General
0302 East Asian Studies
0303 South Asian (India, etc.) Studies
0304 Southeast Asian Studies
0305 African Studies
0306 Islamic Studies
0307 Russian and Slavic Studies
0308 Latin American Studies
0309 Middle Eastern Studies
0310 European Studies, General
0311 Eastern European Studies
0312 West European Studies
1313 American Studies
1314 Pacific Area Studies
0399 Other, Specify

0400 BIOLOGICAL SCIENCES

0401 Biology, General
0402 Botany, General
0403 Bacteriology
0404 Plant Pathology
0405 Plant Pharmacology
9406 Plant Physiology
9407 Zoology, General
0408 Pathology, Human and Animal
0409 Pharmacology, Human and Animal
0410 Physiology, Human and Animal
9411 Microbiology
0412 Anatomy
0413 Histology
0414 Biochemistry
0415 Biophysics
9416 Molecular Biology
9417 Cell Biology (Cytology, Cell Physiology)
9418 Marine Biology
0419 Biometrics and Biostatistics
0420 Ecology
0421 Entomology

0422 Genetics
0423 Radiobiology
0424 Nutrition, Scientific (exclude Nutrition in Home Economics and Dietetics)
0425 Neurosciences
0426 Toxicology
0427 Embryology
0499 Other, Specify

1500 BUSINESS AND MANAGEMENT

0501 Business and Commerce, General
0502 Accounting
0503 Business Statistics
0504 Banking and Finance
0505 Investments and Securities
0506 Business Management and Administration
0507 Operations Research
0508 Hotel and Restaurant Management
0509 Marketing and Purchasing
0510 Transportation and Public Utilities
0511 Real Estate
0512 Insurance
0513 International Business
0514 Secretarial Studies
0515 Personnel Management
0516 Labor and Industrial Relations
0517 Business Economics
0599 Other, Specify

0600 COMMUNICATIONS

0601 Communications, General
0602 Journalism (Printed Media)
0603 Radio/TV
0604 Advertising
0605 Communication Media (use of videotape, film, etc., oriented specifically toward radio/TV)
0699 Other, Specify

0700 COMPUTER AND INFORMATION SCIENCES

0701 Computer and Information Sciences, General
0702 Information Sciences and Systems
0703 Data Processing
0704 Computer programming

0705 Systems Analysis
0799 Other, Specify

0800 EDUCATION

0801 Education, General
0802 Elementary Education, General
0803 Secondary Education, General
0804 Junior High School Education
0805 Higher Education, General
0806 Junior and Community College Education
0807 Adult and Continuing Education
0808 Special Education, General
0809 Administration of Special Education
0810 Education of the Mentally Retarded
0811 Education of the Gifted
0812 Education of the Deaf
0813 Education of the Culturally Disadvantaged
0814 Education of the Visually Handicapped
0815 Speech Correction
0816 Education of the Emotionally Disturbed
0817 Remedial Education
0818 Special Learning Disabilities
0819 Education of the Physically Handicapped
0820 Education of the Multiple Handicapped
0821 Social Foundations (History and Philosophy of Education)
0822 Educational Psychology (include Learning Theory)
0823 Pre-Elementary Education (Kindergarten)
0824 Educational Statistics and Research
0825 Educational Testing, Evaluation, and Measurement
0826 Student Personnel (Counseling and Guidance)
0827 Educational Administration
0828 Educational Supervision
0829 Curriculum and Instruction
0830 Reading Education (Methodology and Theory)
0831 Art Education (Methodology and Theory)
0832 Music Education (Methodology and Theory)
0833 Mathematics Education (Methodology and Theory)
0834 Science Education (Methodology and Theory)
0835 Physical Education
0836 Driver and Safety Education
0837 Health Education (include Family Life Education)
0838 Business, Commerce, and Distributive Education

0839 Industrial Arts, Vocational and Technical Education
0899 Other, Specify

0900 ENGINEERING

0901 Engineering, General
0902 Aerospace, Aeronautical and Astronautical Engineering
0903 Agricultural Engineering
0904 Architectural Engineering
0905 Bioengineering and Biomedical Engineering
0906 Chemical Engineering (include Petroleum Refining)
0907 Petroleum Engineering (exclude Petroleum Refining)
0908 Civil, Construction, and Transportation Engineering
0909 Electrical, Electronics, and Communications Engineering
0910 Mechanical Engineering
0911 Geological Engineering
0912 Geophysical Engineering
0913 Industrial and Management Engineering
0914 Metallurgical Engineering
0915 Materials Engineering
0916 Ceramic Engineering
0917 Textile Engineering
0918 Mining and Mineral Engineering
0919 Engineering Physics
0920 Nuclear Engineering
0921 Engineering Mechanics
0922 Environmental and Sanitary Engineering
0923 Naval Architecture and Marine Engineering
0924 Ocean Engineering
0925 Engineering Technologies
0999 Other, Specify

1000 FINE AND APPLIED ARTS

1001 Fine Arts, General
1002 Art (Painting, Drawing, Sculpture)
1003 Art History and Appreciation
1004 Music (Performing, Composition, Theory)
1005 Music (Liberal Arts Program)
1006 Music History and Appreciation (Musicology)
1007 Dramatic Arts
1008 Dance

1009 Applied Design (Ceramics, Weaving, Textile Design, Fashion Design, Jewelry, Metalsmithing, Interior Decoration, Commercial Art)
1010 Cinematography
1011 Photography
1099 Other, Specify

1100 FOREIGN LANGUAGES

1101 Foreign Languages, General
1102 French
1103 German
1104 Italian
1105 Spanish
1106 Russian
1107 Chinese
1108 Japanese
1109 Latin
1110 Greek, classical
1111 Hebrew
1112 Arabic
1113 Indian (Asiatic)
1114 Scandinavian Languages
1115 Slavic Languages (other than Russian)
1116 African Languages (non-Semitic)
1199 Other, Specify

1200 HEALTH PROFESSIONS

1201 Health Professions, General
1202 Hospital and Health Care Administration
1203 Nursing
1204 Dentistry
1205 Dental Specialties
1206 Medicine
1207 Medical Specialties
1208 Occupational Therapy
1209 Optometry
1210 Osteopathic Medicine
1211 Pharmacy
1212 Physical Therapy
1213 Dental Hygiene
1214 Public Health
1215 Medical Record Librarianship
1216 Podiatry or Podiatric Medicine

1217 Biomedical Communication
1218 Veterinary Medicine
1219 Veterinary Medicine Specialties
1220 Speech Pathology and Audiology
1221 Chiropractic
1222 Clinical Social Work
1223 Medical Laboratory Technologies
1224 Dental Technologies
1225 Radiologic Technologies
1299 Other, Specify

1300 HOME ECONOMICS

1301 Home Economics, General
1302 Home Decoration and Home Equipment
1303 Clothing and Textiles
1304 Consumer Economics and Home Management
1305 Family Relations and Child Development
1306 Foods and Nutrition (include Dietetics)
1307 Institutional Management and Cafeteria Management
1399 Other, Specify

1400 LAW

1401 Law, General
1499 Other, Specify

1500 LETTERS

1501 English, General
1502 Literature, English
1503 Comparative Literature
1504 Classics
1505 Linguistics (include Phonetics, Semantics, and Philology)
1506 Speech, Debate, and Forensic Science (Rhetoric and Public Address)
1507 Creative Writing
1508 Teaching of English as a Foreign Language
1509 Philosophy
1510 Religious Studies (exclude Theological Professions)
1599 Other, Specify

1600 LIBRARY SCIENCE

1601 Library Science, General
1699 Other, Specify

1700 MATHEMATICS

1701 Mathematics, General
1702 Statistics, Mathematical and Theoretical
1703 Applied Mathematics
1799 Other, Specify

1800 MILITARY SCIENCE

1801 Military Science (Army)
1802 Naval Science (Navy, Marines)
1803 Aerospace Science (Air Force)
1899 Other, Specify

1900 PHYSICAL SCIENCES

1901 Physical Sciences, General
1902 Physics, General (exclude Biophysics)
1903 Molecular Physics
1904 Nuclear Physics
1905 Chemistry, General (exclude Biochemistry)
1906 Inorganic chemistry
1907 Organic chemistry
1908 Physical chemistry
1909 Analytical chemistry
1910 Pharmaceutical chemistry
1911 Astronomy
1912 Astrophysics
1913 Atmospheric Sciences and Meteorology
1914 Geology
1915 Geochemistry
1916 Geophysics and Seismology
1917 Earth Sciences, General
1918 Paleontology
1919 Oceanography
1920 Metallurgy
1999 Other, Specify

2000 PSYCHOLOGY

2001 Psychology, General
2002 Experimental Psychology (animal and human)
2003 Clinical Psychology
2004 Psychology for Counseling
2005 Social Psychology
2006 Psychometrics
2007 Statistics in Psychology

2008 Industrial Psychology
2009 Developmental Psychology
2010 Physiological Psychology
2099 Other, Specify

2100 PUBLIC AFFAIRS AND SERVICES

2101 Community Services, General
2102 Public Administration
2103 Parks and Recreation Management
2104 Social Work and Helping Services (other than Clinical Social Work)
2105 Law Enforcement and Corrections
2106 International Public Service (other than Diplomatic Service)
2199 Other, Specify

2200 SOCIAL SCIENCES

2201 Social Sciences, General
2202 Anthropology
2203 Archeology
2204 Economics
2205 History
2206 Geography
2207 Political Science and Government
2208 Sociology
2209 Criminology
2210 International Relations
2211 Afro-American (Black Culture) Studies
2212 American Indian Cultural Studies
2213 Mexican-American Cultural Studies
2214 Urban Studies
2215 Demography
2299 Other, Specify

2300 THEOLOGY

2301 Theological Professions, General
2302 Religious Music
2303 Biblical Languages
2304 Religious Education
2399 Other, Specify

4900 INTERDISCIPLINARY STUDIES

4901 General Liberal Arts and Sciences
4902 Biological and Physical Sciences
4903 Humanities and Social Sciences
4904 Engineering and Other Disciplines
4999 Other, Specify

5000 BUSINESS AND COMMERCE TECHNOLOGIES

5001 Business and Commerce Technologies, General
5002 Accounting Technologies
5003 Banking and Finance Technologies
5004 Marketing, Distribution, Purchasing, Business, and Industrial Management Technologies
5005 Secretarial Technologies (include Office Machines Training)
5006 Personal Service Technologies (Stewardess, Cosmetologist, etc.)
5007 Photography Technologies
5008 Communications and Broadcasting Technologies (Radio/TV, Newspapers)
5009 Printing and Lithography Technologies
5010 Hotel and Restaurant Management Technologies
5011 Transportation and Public Utility Technologies
5012 Applied Arts, Graphic Arts, and Fine Arts Technologies (include advertising design)
5099 Other, Specify

5100 DATA PROCESSING TECHNOLOGIES

5101 Data Processing Technologies, General
5102 Key Punch Operator and Other Input Preparation Technologies
5103 Computer Programmer Technologies
5104 Computer Operator and Peripheral Equipment Operation Technologies
5105 Data Processing Equipment Maintenance Technologies
5199 Other, Specify

5200 HEALTH SERVICES AND PARAMEDICAL TECHNOLOGIES

5201 Health Services Assistant Technologies, General
5202 Dental Assistant Technologies
5203 Dental Hygiene Technologies
5204 Dental Laboratory Technologies

5205 Medical or Biological Laboratory Assistant Technologies
5206 Animal Laboratory Assistant Technologies
5207 Radiologic Technologies (X-Ray, etc.)
5208 Nursing, RN (less than 4-year program)
5209 Nursing, Practical (LPN or LVN--less than 4-year program)
5210 Occupational Therapy Technologies
5211 Surgical Technologies
5212 Optical Technologies (include Ocular Care, Opthalmic, Optometric Technologies)
5213 Medical Record Technologies
5214 Medical Assistant and Medical Office Assistant Technologies
5215 Inhalation Therapy Technologies
5216 Psyciatric Technologies (include Mental Health Aide Programs)
5217 Electro Diagnostic Technologies (include EKG, EEG, etc.)
5218 Institutional Management Technologies (Rest Home, etc.)
5219 Physical Therapy Technologies
5299 Other, Specify

5300 MECHANICAL AND ENGINEERING TECHNOLOGIES

5301 Mechanical and Engineering Technologies, General
5302 Aeronautical and Aviation Technologies
5303 Engineering Graphics (Tool and Machine Drafting and Design)
5304 Architectural Drafting Technologies
5305 Chemical Technologies (include Plastics)
5306 Automotive Technologies
5307 Diesel Technologies
5308 Welding Technologies
5309 Civil Technologies (Surveying, Photogrammetry, etc.)
5310 Electronics and Machine Technologies (TV, Appliance, Office Machine Repair, etc.)
5311 Electromechanical Technologies
5312 Industrial Technologies
5313 Textile Technologies
5314 Instrumentation Technologies
5315 Mechanical Technologies

5316 Nuclear Technologies
5317 Construction and Building Technologies (Carpentry, Electrical Work, Plumbing, Sheet Metal, Air Conditioning, Heating, etc.)
5399 Other, Specify

5400 NATURAL SCIENCE TECHNOLOGIES

5401 Natural Science Technologies, General
5402 Agriculture Technologies (include Horticulture)
5403 Forestry and Wildlife Technologies (include Fisheries)
5404 Food Services Technologies
5405 Home Economics Technologies
5406 Marine and Oceanographic Technologies
5407 Laboratory Technologies, General
5408 Sanitation and Public Health Inspection Technologies (Environmental Health Technologies)
5499 Other, Specify

5500 PUBLIC SERVICE RELATED TECHNOLOGIES

5501 Public Service Technologies, General
5502 Bible Study or Religion-Related Occupations
5503 Education Technologies (Teacher Aide and 2-year Teacher Training Programs)
5504 Library Assistant Technologies
5505 Police, Law Enforcement, Corrections Technologies
5506 Recreation and Social Work Related Technologies
5507 Fire Control Technology
5508 Public Adminsitration and Management Technologies
5599 Other, Specify

APPENDIX C-1

Number of Four-Year Public Institutions with Budgets Reviewed by Techniques Discussed

States	Number of four-year public institutions	Number of campuses included in this report*	Number of campuses excluded from this report	
			Separate medical	Other special
California	31	28	1	2
Colorado	13	12	1	0
Connecticut	6	5	1	0
Florida	9	9	0	0
Hawaii	2	2	0	0
Illinois	13	12	1	0
Kansas	7	6	0	1
Michigan	15	15	0	0
Mississippi	9	8	1	0
Nebraska	7	6	1	0
New York	40	22	5	13
Pennsylvania	24	23	1	0
Tennessee	11	10	1	0
Texas	34	30	4	0
Virginia	15	15	0	0
Washington	6	6	0	0
Wisconsin	13	13	0	0

* Medical programs on these campuses not included.

APPENDIX C-2

Number of Two-Year Public Institutions with Budget Reviews Similar to Four-Year Institutions

States	Community colleges	Vocational, technical institutions	University branches
California	0	0	0
Colorado	7	0	0
Connecticut	12	4	5
Florida	0	0	0
Hawaii	7	0	0
Illinois	0	0	0
Kansas	0	0	0
Michigan	29	0	0
Mississippi	0	0	0
Nebraska	0	0	0
New York	0	10	0
Pennsylvania	0	0	25
Tennessee	10	0	0
Texas	0	0	0
Virginia	23	0	1
Washington	0	0	0
Wisconsin	0	0	14

APPENDIX D

An Interpretation of a Non-Zero Sum Game: The Prisoner's Dilemma

Two suspects are taken into custody and separated. The district attorney is certain that they are guilty of a specific crime, but he does not have adequate evidence to convict them at a trial. He points out to each prisoner that each has two alternatives: to confess to the crime the police are sure they have done, or not to confess. If they both do not confess, then the district attorney states he will book them on some very minor trumped-up charge such as petty larceny and illegal possession of a weapon, and they will both receive minor punishment; if they both confess they will be prosecuted, but he will recommend less than the most severe sentence; but if one confesses and the other does not, then the confessor will receive lenient treatment for turning state's evidence whereas the latter will get "the book" slapped at him. In terms of years in a penitentiary, the strategic problem might reduce to:

		Prisoner 2
Prisoner 1:	Not Confess	Confess
Not Confess	1 year each	10 years for 1 and 3 months for 2
Confess	3 months for 1 and 10 years for 2	8 years each

> . . . The problem for each prisoner is to decide whether to confess or not. The game the district attorney presents to the prisoners is of the non-cooperative variety. (Luce & Raiffa, 1957, p. 95)

If both suspects make their decisions to confess or not on the basis of pure rationality, both will confess, and as Dror (1968) comments, they will spend the next eight years thinking about the limits of pure rationality. This is the rational choice for prisoner 1 because if prisoner 2 does not confess, then prisoner 1 gets only three months instead of one year if he confesses. If prisoner 2 does confess, then prisoner 1 must also confess to avoid serving ten years. The same reasoning holds for prisoner 2. However, this is clearly a worse outcome than if both were not to confess (on the basis of a hunch or extrasensory perception) and then serve only one year.

Publications in the Series of State Budgeting for Higher Education

Glenny, L. A., et al. *State budgeting for higher education: Data digest*

Bowen, F. M., Ruyle, J. H., & Glenny, L. A. *State budgeting for higher education: Budget processes in the 50 states*

Ruyle, J. H., & Glenny, L. A. *State budgeting for higher education: Trends in state revenue appropriations from 1968–1975*

Schmidtlein, F. A., & Glenny, L. A. *State budgeting for higher education: The political economy of the process*

Purves, R. A., & Glenny, L. A. *State budgeting for higher education: Information systems and technical analyses*

Glenny, L. A. *State budgeting for higher education: Interagency conflict and consensus*

Meisinger, R. J., Jr. *State budgeting for higher education: The uses of formulas*

Bowen, F. M., & Glenny, L. A. *State budgeting for higher education: State fiscal stringency and public higher education*